Preliminary Servicing & SWM Report
Draft Plan and Zoning By-law Amendment

1949 Gerber Road
Township of Wellesley

August 2026

MERITECH

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Project No.: 4599

August 14, 2026

James Gies Construction Ltd.
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Attention: Jim Gies
President

Dear Mr. Gies,

Re: Preliminary Servicing & Stormwater Management Report
1949 Gerber Road
Township of Wellesley

Please find our Preliminary Servicing & Stormwater Management Report for the above-noted project, in support of a Draft Plan of Subdivision application and a corresponding Zoning By-law amendment.

This report identifies constraints for sanitary sewerage, water supply, storm drainage/stormwater management, and grading. Where necessary, reasonable assumptions based on normal industry practices have been used and are described as such.

Recommendations from our report shall be incorporated into future phases of the project.

Yours very truly,

MERITECH ENGINEERING

LICENSED PROFESSIONAL ENGINEER
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MS/
Enclosures (1)

cc

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Introduction

The entirety of the lands owned by James Gies Construction comprises 39.7 hectares to the east of Wellesley. The current application, referred to in this report as "Phase 1", consists of 13.1 hectares.

The site is currently zoned agricultural. A two-storey residential building was previously present on the property but was demolished prior to 2018. No other existing structures are present on the site. The site is located northeast of the intersection of Gerber Road and Greenwood Hill Road, on the east side of Wellesley. It is bounded by Greenwood Hill Drive and existing residential homes to the west, agricultural fields to the north and east, and Gerber Road (and south of that, the Nith River) to the south. It lies north of the boundary between the Township of Wellesley and Township of Wilmot, as shown on Figure 1.

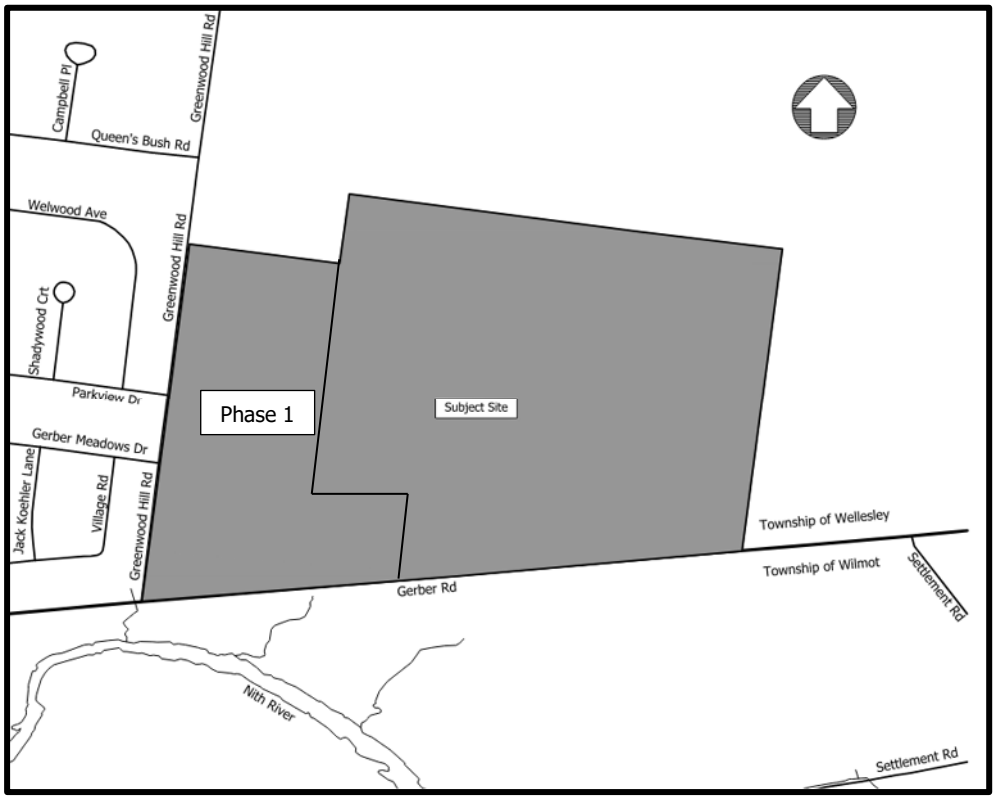


Figure 1: Site Location

The proposed development consists of a residential subdivision that includes residential lots, a park block, commercial block, and a stormwater management (SWM) block. The Draft Plan showing Phase 1 of the development is attached in Appendix A.

As shown on the baseplan in Appendix B, the site generally slopes from north to south, with the lowest point being at the southwest corner. The proposed stormwater management block is located at a low point along the southern property boundary, where a culvert will serve as the outlet, directing flow across Gerber Road and into the Nith River.

Approach

The following flowchart explains a typical submission and approval process. The section highlighted in grey indicates the status of this circulation:

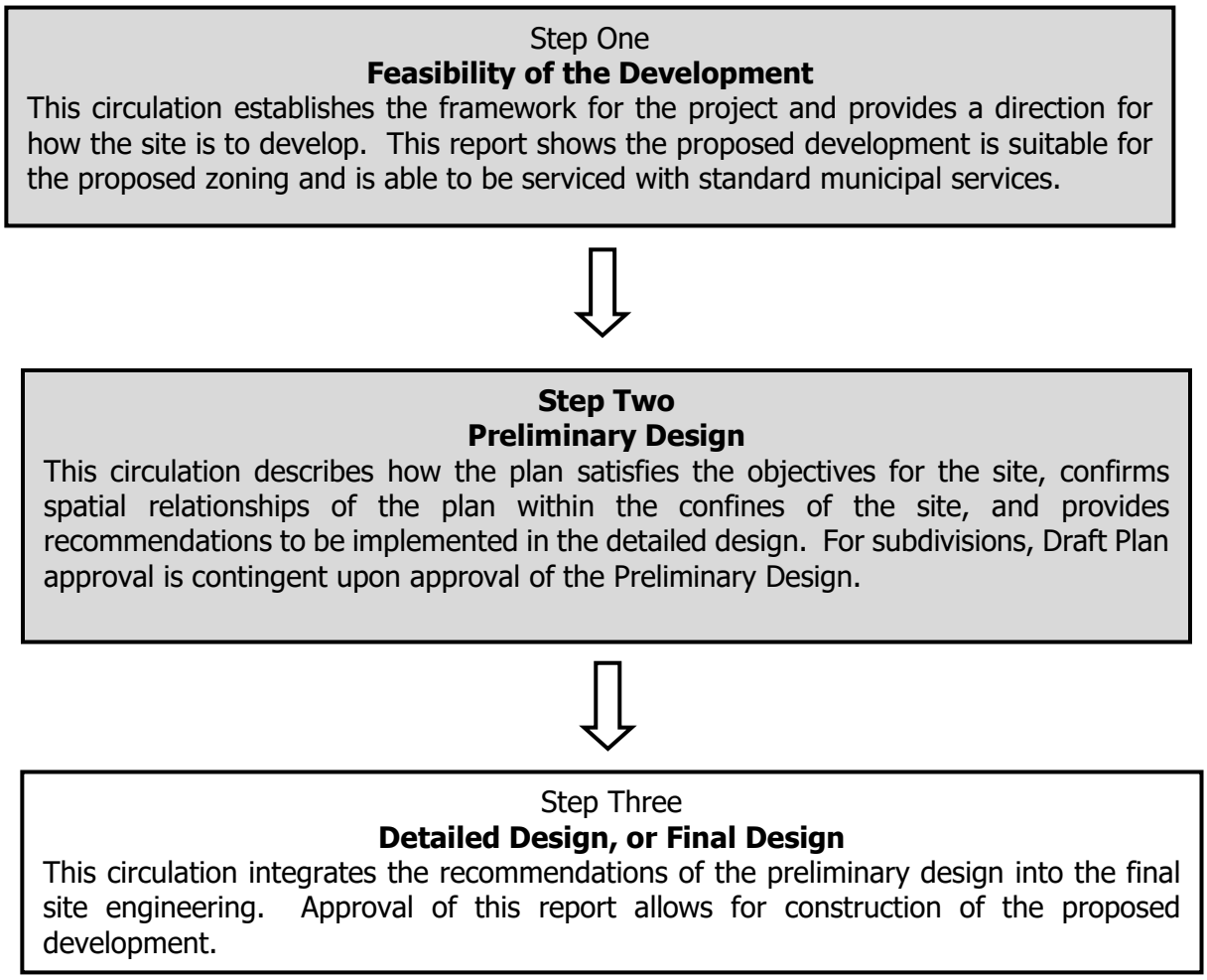


Figure 2: Approach Flowchart

This report has been prepared in support of a Draft Plan of Subdivision application and corresponding Zoning By-law amendment.

Policy Framework

This chapter outlines the framework upon which the plan is built upon. Previous studies, municipal and provincial standards, as well as any field investigations undertaken to support the project, are examples of information described in this chapter. This background information is then used to build an appropriate plan for the site. The next chapter, Objectives and Targets, describes the site-specific requirements noted from the following sources:

MECP Guidelines

Stormwater Management Planning and Design Manual, Ministry of the Environment, 2003
This manual provides guidelines on the planning and design of stormwater management facilities in Ontario.

Design Criteria for Sanitary Sewers, Storm Sewers, and Forcemains for Alterations Authorized under an Environmental Compliance Approval, May 2023
This document provides criteria to be met to ensure that municipal infrastructure is approvable by municipalities under the CLI-ECA structure.

Regional Guidelines

Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services Guidelines (DGSSMS)
The design portion of this annually-updated document (Part B) should be considered as guidelines that provides the municipalities' design preferences under normal circumstances. These guidelines are read together with Municipal guidelines and standards in place.

Region of Waterloo, 2025 Water and Wastewater Report
This document provides information on water use and wastewater flows and treatment capabilities in the Township of Wellesley. It includes information on the Township's water system, wastewater treatment capacity, and future capacities accounting for population growth. It includes graphs of projected flows, system capacity, water supply, and population growth up to 2036.

Regional Master Plans

Wellesley Water and Wastewater Master Plan, Public Consultation Center #1, April 2023
The presentation slides include information regarding the development of a long-term plan for the water and wastewater infrastructure in Wellesley. The slides provide a study boundary that includes approximately one-third of the proposed development, and a graph of population growth within the study boundary.

Wellesley Water and Wastewater Master Plan, Public Consultation Center #2, June 2024
The presentation slides include information regarding alternatives to address water and wastewater capacity needs. It discusses how the alternatives will be evaluated and possible solutions to the capacity needs. It provides a graph for population growth over the next 30

years within the study boundary, which includes approximately one-third of the proposed development.

Wellesley Water and Wastewater Master Plan, Public Consultation Center #3, December 2024
The presentation slides include information regarding the evaluation criteria for the water and wastewater alternatives. It identifies capacity needs and describes the system. The presentation considers what was learned during PCC1 and PCC2, recommends alternatives, and discusses next steps. The study boundary includes approximately one-third of the proposed development.

Draft Wellesley Water and Wastewater Master Plan, February 2026
This report assesses existing and future infrastructure capacity, identifies required upgrades and improvements, and systematically develops a prioritized implementation plan endorsed by the Region and project stakeholders.

Residential population projections were used to estimate future flows and water demand, determine the need for Wellesley's water and wastewater infrastructure, and identify when the recommendations should be implemented to service anticipated growth. The population within the Study Area is anticipated to increase by 1,887 people by 2051. The study area includes a portion of the site.

Municipal Guidelines

Township of Wellesley Development Standards, May 2017
This manual provides design guidelines for servicing and grading of subdivisions.

Municipal Official Plan Update

Township of Wellesley; New Official Plan; Land Use Policy Review and Analysis, Draft November 2025
The report includes information regarding the capacity of Wellesley's water and wastewater systems. There is a capacity to service approximately 10,500 people in the Wellesley Water System and a capacity to service approximately 4300 people in the Wellesley Wastewater Service Area. The report also provides information regarding the projected future flows and the future increase in system capacity.

Township of Wellesley; Official Plan DRAFT, April 2026
The reports include targets used to guide planning for infrastructure, servicing, and community facility needs in the Township to the year 2051. An increase in population of 1820 people is expected by 2051, which leads to the requirement of 630 new homes.

Nethery Planning; Settlement Area Boundary Expansion Requests for the New Township Official Plan, April 2026
This letter confirms an additional 6.1ha of development land will be added to Wellesley's settlement area boundary.

Adjacent Servicing Report

Municipal Servicing Report, Village Estates VI, Wellesley, Ontario, AECOM, May 2017
This report was prepared for the subdivision to the west of the proposed development. This report provided information on the soils in the area and the expected SWM criteria.

Sub-Watershed Plans

There are no sub-watershed studies that guide the stormwater management criteria for the proposed development.

Flood Mitigation Plans

New Hamburg Flood Mitigation Study, Technical Memo 1: Flood Damage Estimates, March 2020
This study was commissioned to evaluate the flood damage estimates for the New Hamburg Flood Mitigation study along the Nith River. The scope of this study falls beyond the proposed development and does not include information that would impact the design of the proposed subdivision.

New Hamburg Flood Mitigation Study, Technical Memo 1: Flood Mitigation Options, March 2020
This study was commissioned to identify potential flood mitigation options to reduce flood damages in New Hamburg, provide a high-level evaluation of potential mitigation options based on estimated flood damages and return-on-investment, and identify and prioritize potential mitigation projects warranting further study or eligible for future funding programs.

The scope of this study falls beyond the proposed development and does not include information that would impact the design.

Source Water Protection

From the MECP's Source Protection Information Atlas, the proposed development is not in a Wellhead Protection Area (WHPA), Issue Contributing Area (IPA) or Intake Protection Zone (IPZ). Therefore, there are no significant drinking water threats, and the site is not in a source water protection area.

The Source Protection Map obtained from the MECP's Source Protection Information Atlas is attached in Appendix E.

Pre-Submission Consultation

Pre-submission comments were received in January 2026. The comments are attached in Appendix E.

Geotechnical Studies

Information received from the Chung & Vander Doelen Engineering Ltd. (CVD) is included in Appendix F. The information received indicates that shallow groundwater generally follows the topography of the site and travels towards the south. The water table depth ranges between 0.98 to 2.80m below ground surface. The groundwater table is quite shallow throughout a large portion of the site, and it is probable that excavations will intercept the water table. However, given that the soils are predominantly comprised of very low permeable silty clay, with the exception of occasional minor granular seams (sand and silt), only limited seepage is anticipated during excavations. Due to the very low permeability of the underlying silty clay soils, infiltration will not be possible.

The Geotechnical Report is currently being prepared by CVD and will be included in the next submission.

Reconnaissance

Meritech staff visited the site in November 2025 in order to become acquainted with the location, verify existing drainage outlets, and take photographs, as seen in Figure 3. A survey was completed by J.D. Barnes in November 2025, to verify existing structures and overall topography of the site.

The first photograph shows the site from the south-east corner looking west along Gerber Road. Photograph 2 is from the middle of the site along Gerber Road, looking west towards the location of an existing culvert, shown in Photograph 3. The fourth photograph shows the site from the south-west corner, looking north along Greenwood Hill Road. Photograph 5 is from the approximately the middle of the north boundary looking south, and the final photo shows an existing driveway, where a house used to be located, prior to being demolished.



1. Looking West



2. Looking West



3. Existing Culvert


4. Looking North


5. Looking South


6. Existing Driveway

Figure 3: Existing Condition Photographs

Objectives and Criteria

This section outlines the objectives and criteria for the wide variety of issues considered in this report; the following section will demonstrate how the objectives presented have been achieved and how the criteria are met.

Sanitary Servicing

The primary objective with respect to sanitary servicing is that a sanitary sewer system servicing the site can be constructed as per MECP, Region of Waterloo (SSMS) and Township of Wellesley standards. Some of the development will outlet into existing infrastructure on Gerber Meadows Drive and Parkview Drive, so it will be necessary to demonstrate that the existing sewers have capacity for this development.

Water Servicing

There are two objectives regarding water servicing: provide domestic water supply as per MECP, Region of Waterloo (SSMS), and Township of Wellesley requirements, and ensure that an adequate firefighting water supply will be available as per Ontario Building Code and Fire Underwriters Survey requirements.

Storm Servicing

The primary objective with respect to storm servicing is that a storm sewer system servicing the site can be constructed as per MECP, Region of Waterloo (SSMS), and Township of Wellesley standards. The drainage for the site will consist of a minor (piped) and major (overland) stormwater collection system that will discharge to a proposed stormwater management facility. Storm sewers should be sized for the 5-year storm.

On-site stormwater management features shall be reviewed in conjunction with the storm servicing.

Stormwater Management

The development of land from rural to urban causes an increase in runoff due to the increase in impervious cover. Additionally, the increased runoff flows faster to receiving watercourses, which, combined with other developed sites, may cause downstream flooding. Therefore, on-site or regional "holding" areas are required to contain the increased runoff and discharge it over a longer period of time while not exceeding the targeted peak flow.

In the absence of explicit design criteria provided by approval agencies, quantity control is proposed to be provided by controlling the post-development peak flows to the pre-development peak flows for all design storms up to the 100-year storm event. A safe overland flow route will be provided for the Regional storm event.

Water quality control is provided for several reasons, including sediment and contaminant (chemical) removal. A "Normal" (70% long-term suspended solids removal) level of water quality control is proposed.

The GRCA pre-submission application checklist has been completed and is included in the submission package.

Grading and Drainage

The typical objective is to reduce the cost of the development by minimizing earthworks costs, excessive retaining walls, etc., in addition to meeting the municipality's requirements related to the grading of useable yards.

The external drainage from the agricultural lands and the unopened road allowance to the north shall not be cut off and shall be accounted for in the stormwater management plan for the subdivision as it is in existing conditions. If external lands are developed in the future,

consideration should be given to the possibility of draining the lands along Greenwood Hill Road to the south, rather than through the subject site.

Transportation

The road network proposed on the Draft Plan should meet the standards of the Municipality.

Utilities

The following utility companies are required to confirm their ability to service the development:

- Enova
- Enbridge Gas
- Canada Post
- Bell Canada
- Rogers Cable
- Mornington

Discussion

Subdivision Design

The site has a total area of 39.2 hectares. Phase 1 of the subdivision is 13.1 hectares and is split between approximately 4 hectares of residential and a 3-hectare commercial block at the south-east corner, adjacent to the proposed stormwater management block. A 1-hectare park block is also included within the layout. The overall site configuration is shown in the Draft Plan in Appendix A.

As described in the pre-submission consultation comments, a widening will be required along Gerber Road.

The subdivision roads will connect to Greenwood Hill Road at two locations: Gerber Meadows Drive and Parkview Drive.

Sanitary Servicing

As described above, Phase 1 is split between residential and commercial uses. Future development lands (the remaining portion of the site) could add approximately 17.6 hectares of additional residential lands; the total site could have roughly 21.5 hectares of residential area. The potential number of lots for the future development has been estimated based on the current Draft Plan's density of 48 townhouse units per hectare. Phase 1 is up to 185 lots, and the remaining lands could provide an additional 840 lots.

Based on the estimated unit counts, peak flows were calculated by applying peaking factors to the average day demands shown in Table 1. A small number of lots can be directed through the existing Parkview Drive sanitary sewers, and the remainder of the site will be directed

through a proposed sewer on Gerber Road. A Sanitary Drainage Area Plan is included in Appendix B.

Unit Type	Flow
Commercial	1.25 L/s/ha
Residential	275 L/cap/day
Infiltration	0.25 L/s/ha

Table 1: Sanitary Flow Rates

Phase 1, with up to 185 residential units and the commercial block, will generate peak flows of 11.4 L/s. The future development lands could generate flows of approximately 27.7 L/s, resulting in the total flows from the site of approximately 39 L/s.

All flows will ultimately be conveyed to the Wellesley Wastewater Treatment Plant. In 2023, the Township commenced a study to develop a long-term water and wastewater servicing plan. The study assessed current and future capacity needs and provided solutions to accommodate future urban growth. The study boundary includes approximately one-third of the proposed development site, as shown on the Draft Plan in Appendix A. The planned upgrades to Wellesley's sanitary sewer system (described in PCC #3 slides as "Firella Creek Capacity Increase") and improvements at the WWTP – also described in the PCC #3 slides – will ensure that sufficient capacity is available to support the wastewater demands of new development.

The Draft Wellesley Water & Wastewater Master Plan Report, February 2026, include the following recommendations regarding wastewater collection & conveyance:

- **Firella Creek Trunk Sewer:** To provide additional capacity, I/I reduction measures will be implemented along with WTP backwash mitigation measures. The Firella Creek trunk sewer is proposed to be replaced with a 750mm diameter sewer within the next 5 years. The report points out an opportunity to provide a 90 angle of connection between the local sewer on Gerber Road and the trunk sewer.
- **Local sewer capacity:** Sewer upgrades are proposed on Nafziger Road and Gerber Road to increase capacity. However, the I/I reduction component will be further explored prior to implementing infrastructure upgrades.
- **Upgrades to the Existing Wastewater Treatment Plant:** The recommendation is to construct a new influent pump station and a 5,900 m^3 equalization basin to handle future growth within the next 5 years. The existing pump station will need to be demolished, and a new station will need to be constructed. New influent pump station, including a new 3-m wet well, three pumps and their associated piping and ancillary equipment.

The Township of Wellesley; New Official Plan; Land Use Policy Review and Analysis, Draft November 2025 includes the following verbiage: *The Municipal Class Environmental Assessment projects growth for Wellesley Village to grow from its current population of 3,700 to approximately 5,600 by 2051 and will evaluate and the most effective ways to provide these services through upgrades to existing wastewater servicing infrastructure and proposed new projects. The report also recommended a significant need for capacity and process*

upgrades at the existing Wellesley Wastewater Treatment Plant in order to service growth needs and upgrades to the Firella Creek Trunk Sewer.

A gravity outlet to the existing system is preferred over a sanitary pumping station. As shown on the Concept Plan and Sanitary Drainage Area Plan in Appendix B, there are three potential outlets by gravity:

1. **Parkview Drive Outlet**
   A 200 mm diameter sanitary sewer drains west towards the Firella Creek Trunk Sewer. The slope of the sewer near Greenwood Hill Road is 1%; however, several sections to the west are at ±0.5%, limiting the available capacity of this option to approximately 14.5 L/s.

   The grading concept for the subdivision (see Appendix B) allows for 0.62 ha or approximately 30 lots to be serviced to this outlet. As shown in the Sanitary Design Sheet in Appendix C, this small number of units would generate roughly 1 L/s of peak flow, which does not exceed the existing capacity.

2. **Gerber Meadows Outlet**
   A 200mm diameter sanitary sewer stub is located approximately 5 meters into the site at the west property line at the extension of Gerber Meadows Drive, having previously been extended underneath Greenwood Hill Road.

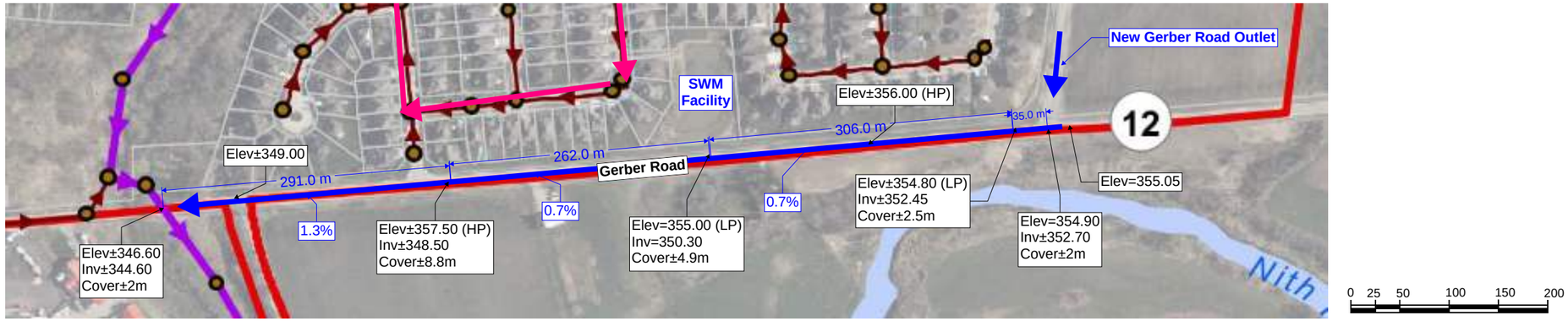
   This outlet has sufficient capacity to service a large portion of the Phase 1 lands. It can accommodate the 3.27 ha of residential area not draining to Parkview Drive excluding the commercial block; alternatively, the entire commercial block together with approximately 1.5 hectares of the Phase 1 residential area.

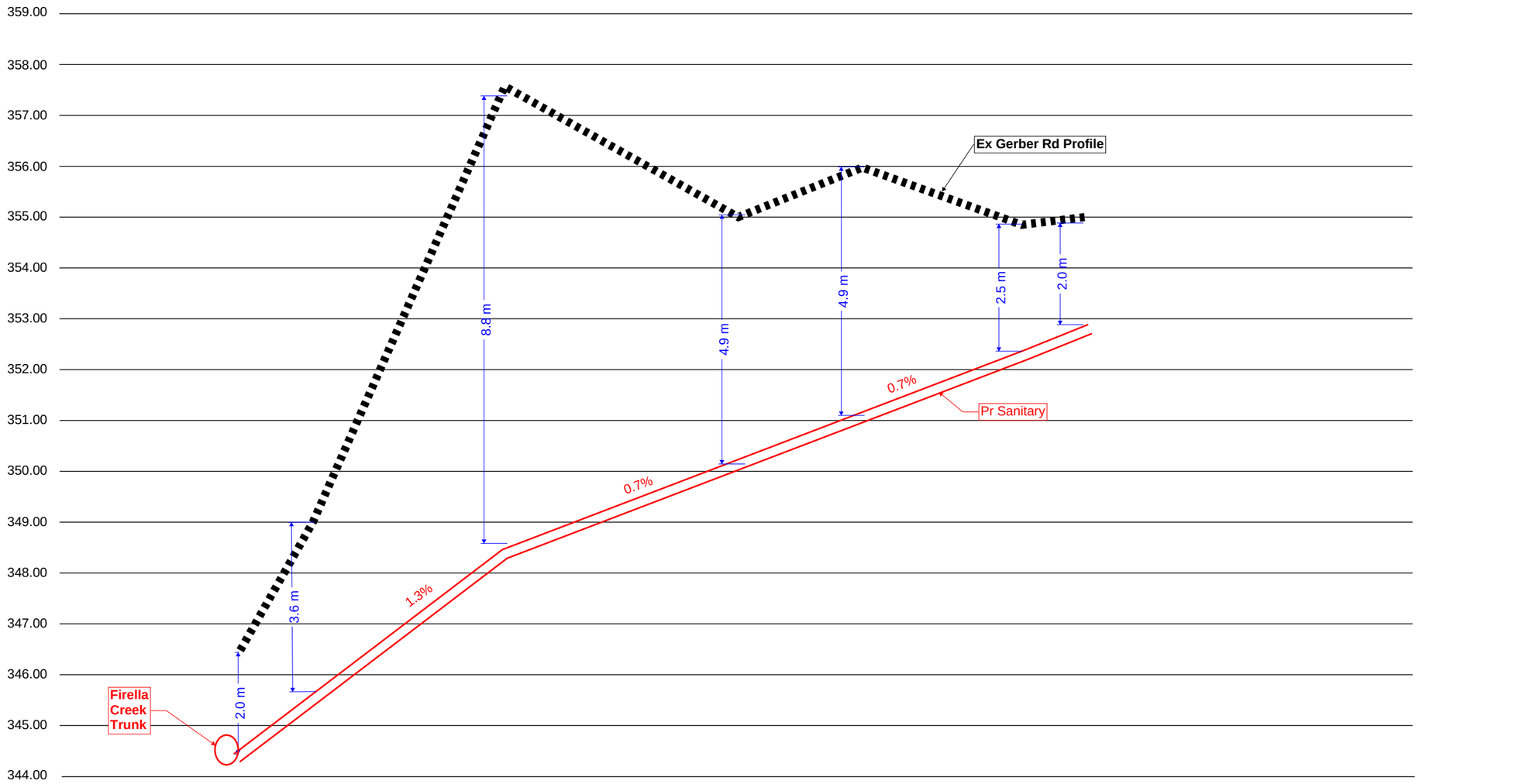
3. **Gerber Road Outlet**
   The direct path to the Firella Creek Trunk Sewer from the proposed subdivision is along Gerber Road. Shown on Figure 4 are conceptual elevations of a new sewer that can service the entirety of the lands.

   The Phase 1 lands which can drain to the Gerber Meadows outlet, together with the entirety of the future development lands, can be directed through the proposed Gerber Road sanitary sewer and connect to the Firella Creek Trunk. The proposed Gerber Road sewer (250mm diameter sewer at a slope of 0.7%) will also be able to convey the design flows of 38 L/s from Phase 1 (less the small area draining to Parkview Drive) and the future development.

FIGURE 4

Gerber Road Profile
12-May-2026





Water Servicing

The Wellesley Water and Wastewater Master Plan speaks to the availability of an adequate water supply for Wellesley.

There is no existing watermain along Greenwood Hill Road. There are 150mm watermains located on Gerber Meadows Drive and Parkview Drive, with stubs that end at their intersections with Greenwood Hill Road. A 300mm watermain sleeve is installed across Greenwood Hill Road, directly across from Gerber Meadows Drive, and into the site.

One fire hydrant is located on Gerber Meadows Drive, approximately 25m west of Greenwood Hill Road. A second hydrant is located at the intersection of Parkview Drive and Greenwood Hill Road, and a third hydrant is positioned at the intersection of Queen's Bush Road and Greenwood Hill Road.

The watermain is proposed to connect to the existing main at the Gerber Meadows Drive and Greenwood Hill intersection. Water modelling from the Region is attached in Appendix C. Requirements such as hydrant locations and fire walls will be confirmed based on the modelling results received during preliminary design.

The Draft Wellesley Water & Wastewater Master Plan Report, February 2026, include the following recommendations regarding water distribution, storage alternatives and infrastructure upgrades:

- **Well Capacity Evaluation:** It is recommended to supplement existing wells with a new well supply from outside the urban boundary near the south-east end of the Village of Wellesley. A new watermain is proposed to be constructed to convey flow from the new well to the existing Wellesley WTP. The above solutions would provide a minimum additional capacity of 196 m^3/d to meet future needs.
- **Future Storage Facility:** A new 1500 m^3 elevated tank is proposed to be constructed at the Bill Gies Recreation Centre lands. For the watermain connection, 1,000 m of 200 mm diameter watermain is assumed to be required from the water tower location to connect to the existing system, buried at 15m -1.8m depth.
- **Industrial, Commercial & Institutional (ICI) Fire Flow:** The need for ICI fire flows was identified where Fire Flow Available (FFA) is less than 175 L/s. It is recommended that the 200mm diameter watermain on Queen's Bush Road from David Street be upgraded to 250mm diameter for better service for the proposed water tower. To meet the fire flow required for the other ICI locations evaluated, upgrading the 200mm diameter watermain on Queen's Bush Road from Nafziger Road to the Bill Gies Recreation Centre to 300mm diameter is recommended.

The Township of Wellesley; New Official Plan; Land Use Policy Review and Analysis, Draft November 2025 includes the following verbiage: The Municipal Class Environmental Assessment projects growth for Wellesley Village to grow from its current population of 3,700 to approximately 5,600 by 2051 and will evaluate and the most effective ways to provide these services through upgrades to existing water servicing infrastructure and proposed new projects.

The Draft Official Plan also identified the need to increase water supply capacity by 2034 to service growth and includes studies to examine increasing capacity at the existing Wellesley wells, as well as supply from potential new wells. The requirement for a new storage facility has been identified with the preferred location on the Bill Gies Recreation Centre lands.

However, according to the 2025 Water and Wastewater Monitoring Report, using the 5-year average per max day capita demand, there is capacity to service approximately 6,800 additional people in the Wellesley Water System as of December 31, 2024. Therefore, there appears to currently be adequate water capacity to service both Phase 1 of the development and the additional future development lands.

The average day demand for the entire site was calculated using 185 lots as shown on the Draft Plan, attached as Appendix A. Based on this, the average day demand in Phase 1 for the 185 townhouse lots is 1.2 L/s, and an allowance for the commercial block, dependent on factors such as anticipated use and building sizes - which will be defined at a later stage. The demand for the remaining future lands is 5.4 L/s, which means the entire site would need approximately 6.5 L/s for residential use. Calculations are attached in Appendix C.

The anticipated peak firefighting demand was calculated using both the FUS and OBC methods. The required fire flow demand for an assumed building of 6 townhouse units with standard clearances is ±154 L/s based on the FUS method when utilizing fire walls (up to 265 L/s without fire walls), and 75 L/s based on the OBC method. The calculations are attached in Appendix C.

The Region of Waterloo's preliminary water modelling results are attached in Appendix C. The modelling considered three existing hydrants: at Gerber Meadows, Parkview Drive, and Queen's Bush Road. The highest design flow is at the Queen's Bush hydrant with 133.24 L/s. The hydrants at Gerber Meadows Drive (JCT_10267) and Parkview Drive (JCT_10109) are at a dead end, and therefore, the results are not an accurate representation of the flows that will be available once the system is looped.

During preliminary design, updated modelling from the Region of Waterloo will be requested. An internally-looped configuration will better confirm available fire flows, which will inform the required fire flow capacities, pipe sizes and potential fire wall requirements or building size restrictions.

Storm Servicing

The runoff from the proposed development will be divided by a drainage split. The flows will be directed through the storm sewer system and discharge into the proposed stormwater management facility for quantity and quality control. To allow for most of the overflow drainage from the subdivision to be directed to the SWM facility, high points are proposed on Street One and Street Two. The result is that minor areas are being directed to Greenwood Hill Road, as shown on the Concept Plan. There is an existing 600mm diameter storm sewer along Greenwood Hill Road along the entire length of the site. It conveys flows south, along the west side of the road, into a culvert under Gerber Road which then discharges to the Nith River.

The pond's inlet and outlet pipes were conceptually sized using the storm sewer design sheet included in Appendix C.

Stormwater Management

From the background information and criteria presented in previous chapters, an appropriate stormwater management plan was developed. This chapter describes the project-specific stormwater plan in detail.

Water Table

Determination of the water table elevation is currently underway. However, GRCA mapping indicates that the groundwater level at the low point at the south end of the site may be coincident with the water level of the Nith River, approximately 13m lower than the site, and that there is groundwater flow towards the river.

Soils

From the soil information available on AgMaps, the soils on site are a mix of Bookton Sandy Loam and Tavistock Loam. The Hydrologic Soil Group is a combination of Group B and C soils. The Municipal Servicing Report from the adjacent subdivision (Village Estates VI) describe the soil in the area as "silty clay till with stones". For modelling, the soils present on site are assumed to be Hydrologic Soil Group C, which is not conducive to infiltration. The geotechnical investigation is currently underway and until a geotechnical report is available, it is assumed that the soils are not suitable for extensive infiltration measures such as SAPs or an end-of-pipe infiltration gallery.

Environmental Constraints

The site is not a significant groundwater recharge area, nor does it have a highly vulnerable aquifer. There are no vegetation communities downgradient other than the vegetation along the river that is supported by the river itself. Therefore, there is no requirement to maintain existing infiltration on site. According to GRCA GIS Mapping, the Nith River and its tributaries are a warm water system.

Quantity

Catchment Numbering Convention

The following catchment number convention was used to identify the characteristics of each catchment:

Description:			Catchment #
Existing	Internal	Uncontrolled	100
Existing	External	Uncontrolled	200
Existing	Internal	Controlled	300
Existing	External	Controlled	400
Proposed	Internal	Uncontrolled	500
Proposed	External	Uncontrolled	600
Proposed	Internal	Controlled	700
Proposed	External	Controlled	800

Table 2: Catchment Naming Convention

Hydrologic Model

Hydrologic modelling was performed using MIDUSS software, which is a widely accepted model for urban developments. It has been used for many years in the Region of Waterloo. A Chicago-type storm was selected, and coefficients for the various storm events were taken from the Region of Waterloo IDF curves.

Rainfall Data

Storm Event	Definition	a	b	c	r
25mm, 4 hour	Design quality	509	6	0.7989	0.375
5-year, 4 hour	Minor system	1593	11	0.8789	0.375
100-year, 4 hour	Major system	4688	17	0.9624	0.375

Table 3: Coefficients for Synthetic Design Storms

Pre-Development

From the information obtained from the topographic survey, the Municipal Servicing Report prepared by AECOM for the existing subdivision to the west, and the Ontario Watershed Information Tool, the site is a part of 4 tributaries that ultimately drain to the Nith River. Figure 6 shows the limits of the four tributaries.

The tributary on the west side of the site (Tributary 1) drains to the storm sewer system on Greenwood Hill Road. The middle tributaries (Tributary 2 & 3) drain to existing culverts on Gerber Road and are conveyed to the Nith River. The tributary to the east drains to an existing culvert to the east of the site on Gerber Road. This eventually drains into a Municipal

Drain known as the Roth West Drain, which also discharges to the Nith River. The Lichty, Wagner, Roth Drain Plan and Profiles are attached in Appendix E.

At Hurricane Hazel, the majority of the site flows towards the low point at the intersection of Gerber Road and Greenwood Hill Road and tips over the centerline of Gerber Road and flows towards the Nith River.

Figure 6 shows the pre-development catchment plan for the existing site.

Suitable modelling parameters for each of the catchments were chosen, as presented in Table 4. The SCS curve number soil parameters, estimated from standard tables, represent pasture/rangeland in good condition (CN=74) and cultivated land with conservation treatment (CN=88) for the soil group C. Generated peak flows from each catchment are also summarized in Table 4.

Catchment	Area (ha)			Imper-vious	Slope Length	Slope Gradient	SCS CN	Uncontrolled Peak Flow (m^3/s)	
	Controlled	Uncontrolled	Total	(%)	(m)	(%)	(perv)	5-year	100-year
Internal									
101		7.97	7.97	0	100	1.5	88	0.531	1.741
102		15.80	15.80	0	200	1	88	0.953	3.192
103		11.06	11.06	0	200	1	88	0.481	1.619
104		4.43	4.43	0	100	1	88	0.267	0.895
Subtotal:			39.26						
External									
201		5.56	5.56	5	50	1	74	0.161	0.732
202		6.11	6.11	0	150	1	88	0.306	1.025
Subtotal:			11.67						
Total			50.93					2.621	8.896

Table 4: Pre-Development Modelling Parameters

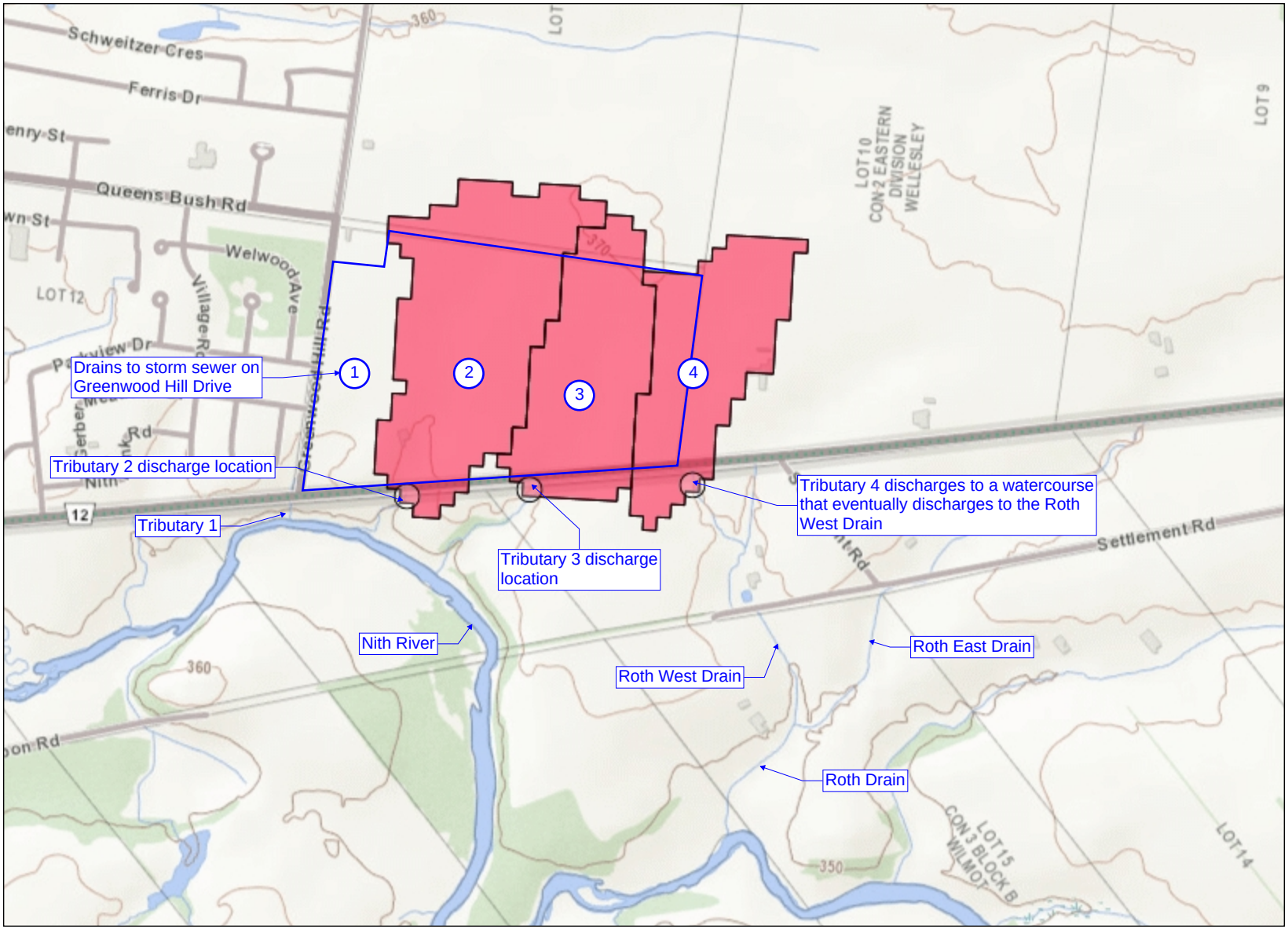
MINISTRY OF NATURAL RESOURCES

Ontario Watershed Information Tool

1949 Gerber Road Tributaries

Notes:

Figure 5



Legend

- Assessment Parcel
- Secondary Watershed
- Tertiary Watershed
- Quaternary Watershed
- Great Lakes - St. Lawrence Basin
- Hudson - James Bay Basin
- Nelson River Basin
- Hydrometric Monitoring Station
- Diversions
- Waterbody Outlet
- Conservation Authority Dam
- Provincial Dam
- Federal Dam
- OPG Dam
- Other Dam
- Virtual Flow Segment

Land Cover Compilation

- Other
- Cloud/Shadow
- Clear Open Water
- Turbid Water
- Shoreline
- Mudflats
- Marsh
- Swamp
- Fen
- Bog
- Heath
- Sparse Treed
- Treed Upland
- Deciduous Treed
- Mixed Treed
- Coniferous Treed
- Plantations - Treed Cultivated
- Hedge Rows
- Disturbance
- Open Cliff and Talus
- Alvar
- Sand Barren and Dune
- Open Tallgrass Prairie
- Tallgrass Savannah
- Tallgrass Woodland
- Sand/Gravel/Mine Tailings/Extraction
- Bedrock
- Community/Infrastructure
- Agriculture and Undifferentiated Rural Land Use

0.7 0 km 0.33 0.7

Scale: 1 : 13,104

Projection: Web Mercator

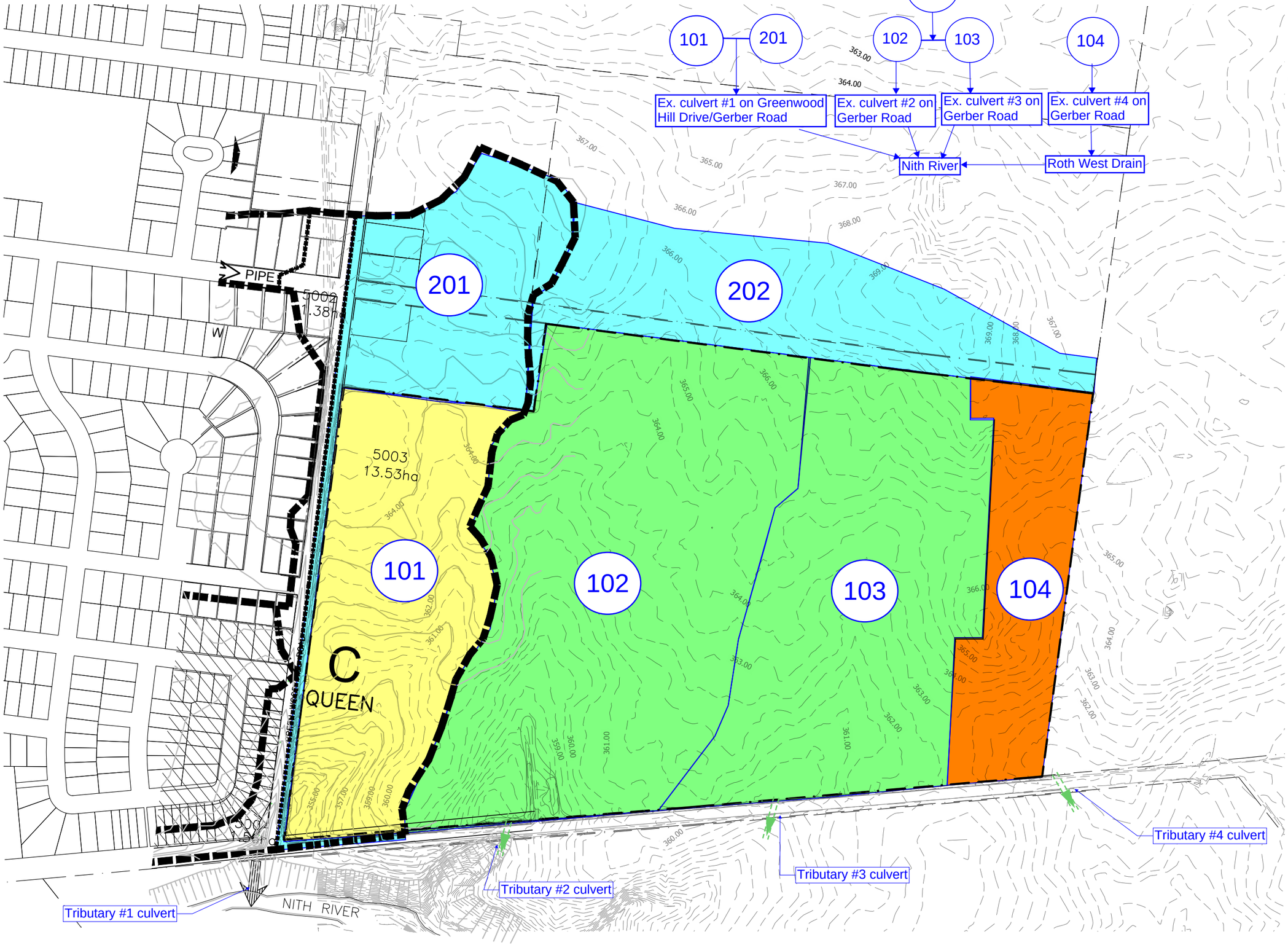


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1:4000

DRAWING: 1949 Gerber Road
Pre-Development Catchment Plan

DRAWN BY:	MS	CHECKED BY:	CHT
FILE NAME:	4599.Fig	DATE:	May 20, 2025

SCALE: 1:4000

Figure 6

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Post-Development

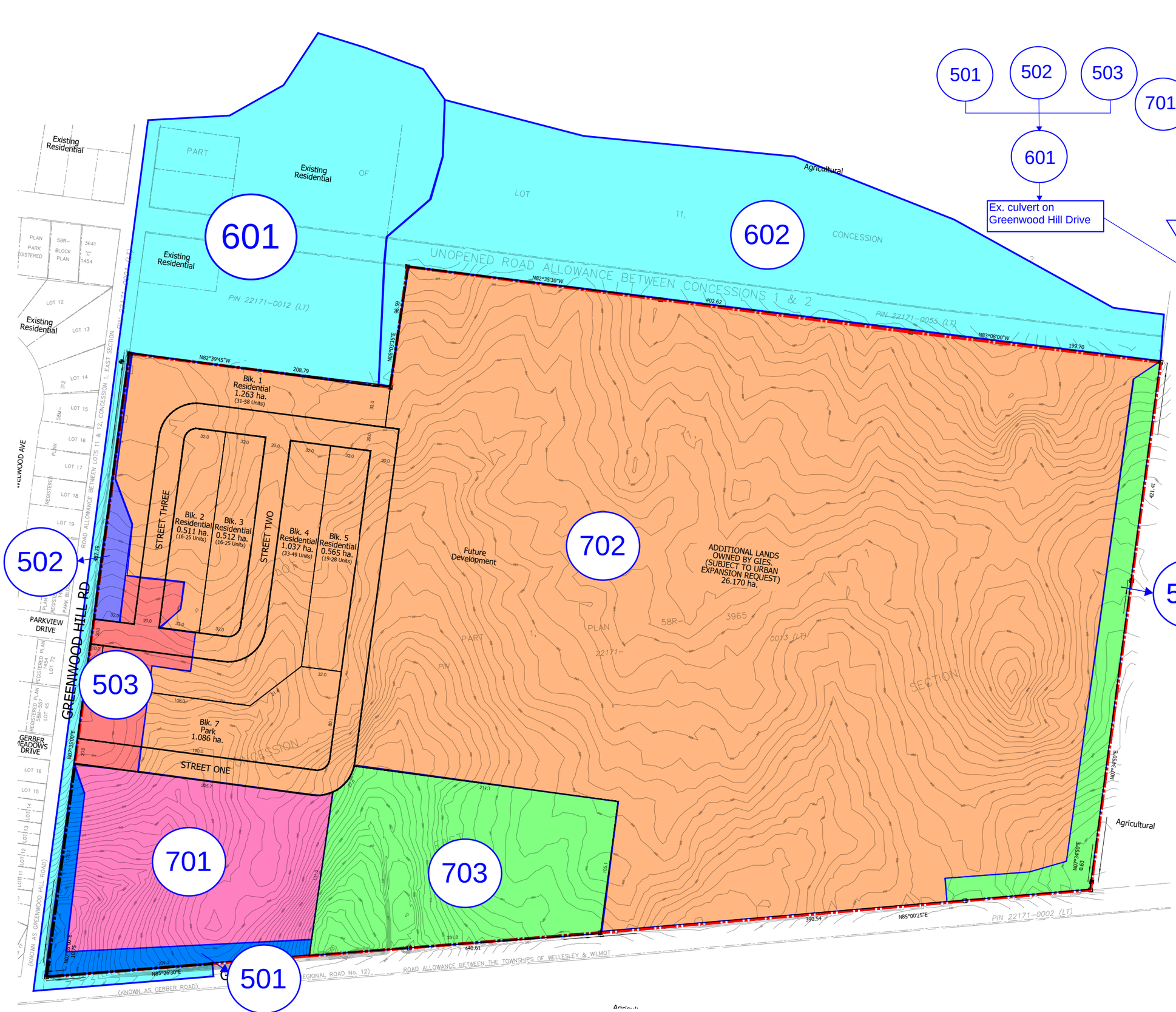
Figure 7 shows the post-development catchment plan and the routing chart for the proposed project. The drainage from the external existing agricultural land and the unopened road allowance owned by the Township (Catchment 602) draining into the site from the north has been accounted for in the SWM facility, in their existing undeveloped condition. Catchment 601 flows to the existing structure in Tributary 1 and has been accounted for in the adjacent subdivision's stormwater management plan as undeveloped as well. If these lands are developed in the future, they should be directed either to the north or to outlet #1.

Suitable modelling parameters for each of the catchments were chosen, as presented in Table 5. The SCS curve number soil parameters, estimated from standard tables, represent pasture/rangeland in good condition (CN=74) and cultivated land with conservation treatment (CN=88) for the soil group C.

Generated peak flows from each catchment are also summarized in Table 5. Refer to the MIDUSS modelling results in Appendix D.1 for further information.

Catchment	Area (ha)			Imper-vious	Slope Length	Slope Gradient	SCS CN	Uncontrolled Peak Flow (m^3/s)	
	Controlled	Uncontrolled	Total	(%)	(m)	(%)	(perv)	5-year	100-year
Internal									
701	2.55		2.55	75	20	1	74	0.576	1.094
702	31.14		31.14	65	50	1	74	5.921	11.377
703	2.90		2.90	85	1	1	74	0.721	1.327
501		0.50	0.50	0	20	25	74	0.032	0.117
502		0.25	0.25	65	15	2	74	0.050	0.096
503		0.86	0.86	65	10	2	74	0.170	0.336
504		1.06	1.06	65	20	10	74	0.209	0.414
Subtotal:			39.26						
External									
601		5.56	5.56	5	50	1	74	0.161	0.732
602	6.11		6.11	0	150	1	88	0.306	1.025
Subtotal:			11.67						
Total			50.93					8.146	16.489

Table 5: Post-Development Modelling Parameters



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DRAWING: 1949 Gerber Road
Post-Development Catchment Plan

DRAWN BY: MS	CHECKED BY: CHT	SCALE:	
FILE NAME: 4599.Fig	DATE: May 20, 2026		Figure

Proposed Outlet Configuration

The existing outlet to Tributary 3 is shallow. Large amounts of fill will be required throughout the subdivision in this case. Tributary 4 drains to a Municipal Drain. Therefore, this outlet was not considered a viable option. Tributary 1 drains to the existing sewer on Greenwood Hill Drive. The sewers on Greenwood Hill Drive may be used for the drainage from the future development to the north. Therefore, this option was not chosen. The existing outlet at Tributary 2 was chosen as the outlet for the proposed SWM facility, as it is the deepest and minimizes the quantity of fill that would be required to raise the entire subdivision.

Quality

Forebay

The proposed stormwater management pond includes a sediment forebay designed in accordance with the Aesthetic Design Principles for Storm Water Management Facilities in the Region of Waterloo, and Ministry of the Environment guidelines. Typically, the forebay can blend into proposed walking trails and maintenance access routes. The conceptual forebay design is included in Appendix C.

Water Quality and Extended Detention

Table 6 shows the difference in the required permanent pool volume for the 42.70 ha area draining to the SWM facility between a wetland and a wet pond based on Table 3.2 of the MOE Planning & Design Manual.

	Storage required (m^3/ha)	Dead storage required (m^3/ha)	Area (ha)	Dead storage required (m^3)	Average PP depth (m)	Permanent pool size (m^2)
Wet pond	123.5	83.5	42.70	3,565	1.5	2,380
Wetland	77	37	42.70	1,580	0.25	6,320

Table 6: Conceptual SWM Facility Land Use Comparison

From Table 7, the area required to accommodate a wet pond is less than half the area required for a wetland. Therefore, a wet pond with a forebay is proposed as a suitable end-of-pipe facility for the proposed development.

The wet pond was designed in accordance with Table 3.2 of the MOE Planning & Design Manual to ensure that quality control conditions could be met. Based on an "normal" level of protection and an imperviousness of 65%, the following volumes are required.

Contributing Area (ha)	Permanent Pool Required (m³/ha)	Permanent Pool Required (m³)	Permanent Pool Provided (m³)	Extended Detention Required (m³/ha)	Extended Detention Required (m³)	Extended Detention Provided (m³)
42.70	83.5	3,565	3,635	40	1,710	4,154

Table 7: Water Quality Storage Requirements

The extended detention shown above is defined as the active storage in the design quality (25mm) storm event. Runoff is retained in the pond over the recommended 24-hour period in order to enhance water quality.

Performance of the Stormwater Management Facility

Three outlets are proposed for the SWM facility. The first is a 375mm diameter reverse-slope pipe that connects to a manhole and conveys flow to a ditch-inlet catchbasin manhole. The remaining two outlets consist of twinned 600mm diameter culverts discharging from a headwall into a roadside ditch along Gerber Road, which then directs the flow to the same ditch-inlet catchbasin manhole. The entire outlet system is proposed to drain through a proposed 900mm diameter pipe across Gerber Road and discharges into the existing ravine. The existing 800mm culvert at that location will be removed/replaced.

The striped hatched area in Figure 8 below represents the GRCA floodplain limit, which is up to an elevation of ±347.00. Therefore, the proposed outlet to the watercourse (±353.50) is well outside the floodplain limit.

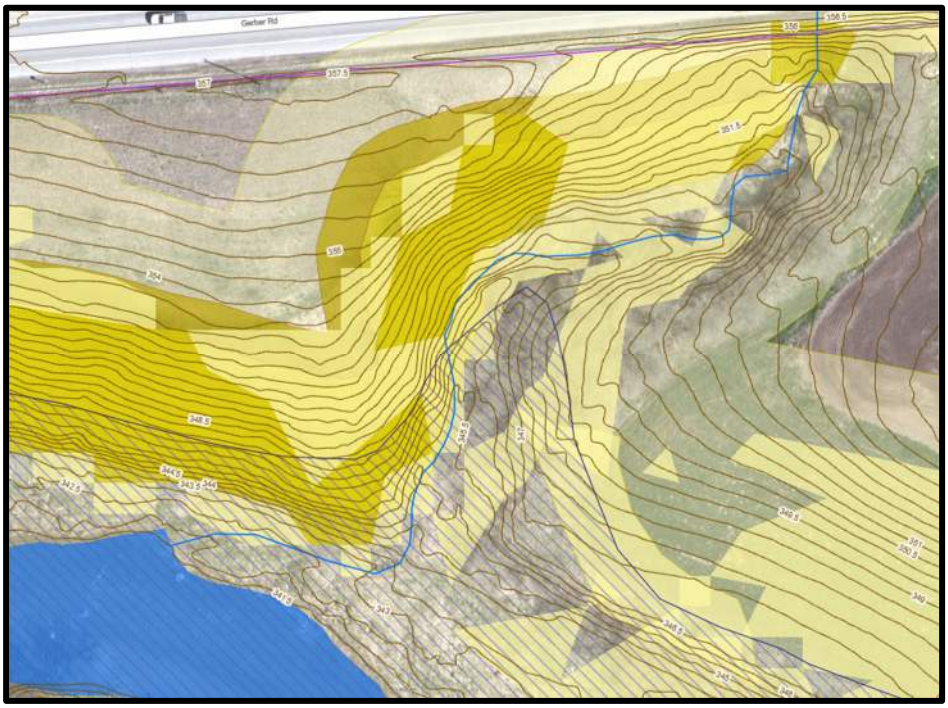


Figure 8: GRCA Floodplain Limit

Through the future detailed design process, it will be demonstrated that the facility's features work to meet the objectives set forth on matters including (for example):

- A central location, with easy access, for sediment removal
- Pre-treatment
- Extended detention water quality treatment
- Flood control up to the 100-year storm event, matching existing peak flows
- Safe overland flow route for the Regional storm event
- A "baseflow" component (extended detention drawdown)
- An aesthetically pleasing facility designed to blend into surrounding lands
- Easily maintainable and accessible inlets and outlets
- An adequately sized block on the draft plan

Table 8 presents the total peak flow for 5 and 100-year storm events. The controlled outflows are less than the allowable (pre-development).

Event/Condition	5-year (m^3/s)	100-year (m^3/s)
Pre-development	2.621	8.896
Attenuated post-development	0.735	3.059

Table 8: Comparison of Attenuated Peak Flows (Entire Site)

The outlet from the SWM facility is to the watercourse, where the existing Tributary 2 (Catchment 102) outlets to. Table 9 compares the attenuated peak flows from the SWM facility to the pre-development flows from Catchment 102.

Event/Condition	5-year (m^3/s)	100-year (m^3/s)
Pre-development (Catchment 102)	0.953	3.192
Attenuated post-development from SWM facility	0.609	2.597

Table 9: Comparison of Peak Flows to Tributary 2 Outlet

From Table 9, the discharge to the existing watercourse from the SWM facility at the post-development conditions does not exceed the existing peak flows to the watercourse.

Pond volumes for the conceptual SWM facility were estimated using the "Rectangular Storage" command in MIDUSS. The resulting stage-storage characteristics of both the forebay and wetland cell are summarized in Table 10.

Description	Elevation (m)	Depth (m)	Volume (m^3)	Discharge (m^3/s)
Bottom of Forebay and Wet Pond	354.70	-	-	-
Permanent Pool	356.70	0	-	-
Extended detention (25mm)	357.25	0.55	4,158	0.161
5-year ponding	357.90	1.20	9,478	0.609
Weir elevation	358.65	1.95	17,190	1.565
100-year ponding	358.80	2.10	18,460	2.543
Hurricane Hazel ponding	359.09	2.39	22,097	5.572
Top of Freeboard	359.10	2.40	22,222	5.443

Table 10: Pond Performance Table

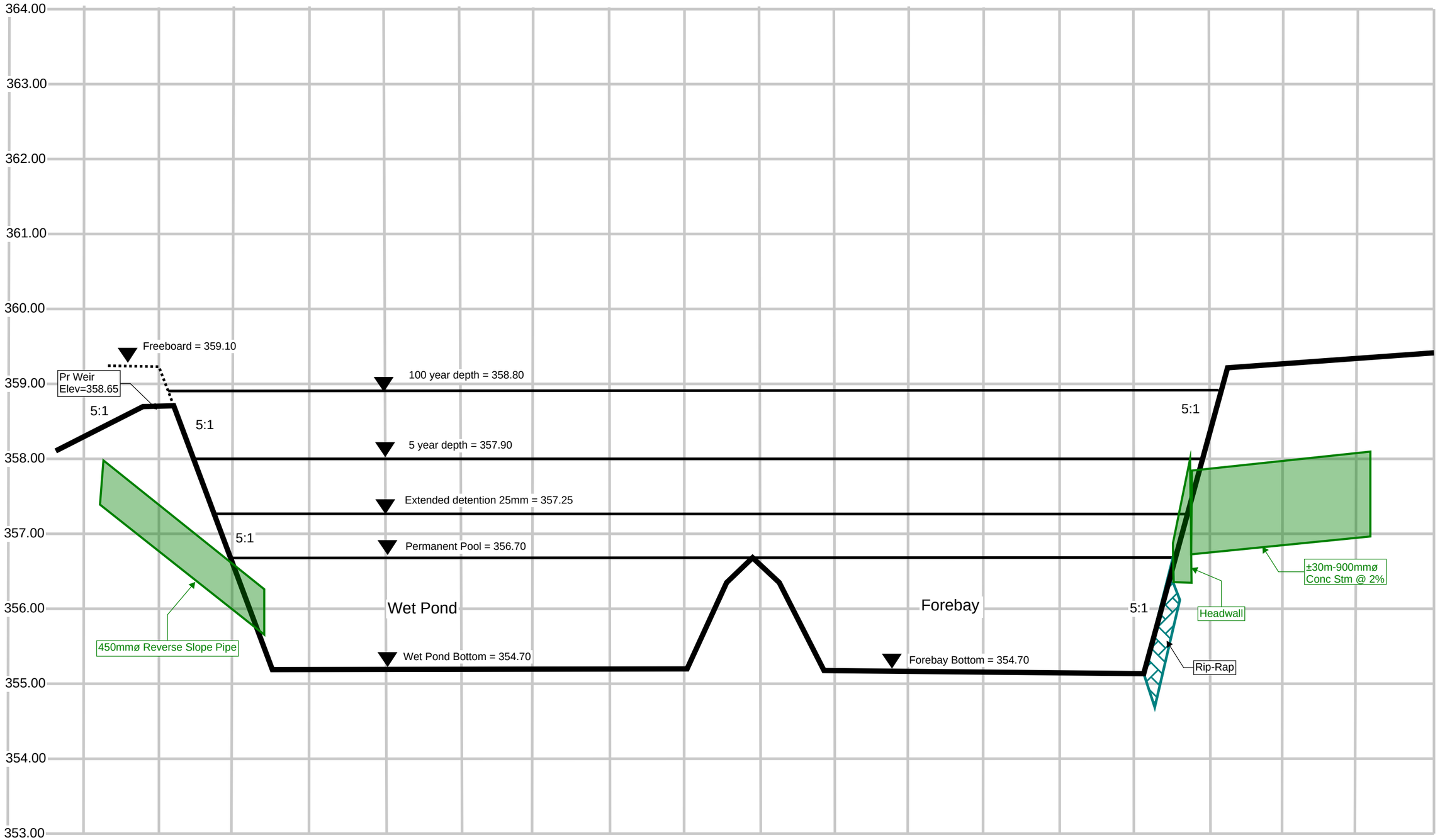
As seen in Table 10, the pond is adequately sized to safely convey the Hurricane Hazel storm event through the proposed weir. Since there is no sag on Gerber Road in front of the proposed pond, the drainage flows to the existing low point at the Gerber Road and Greenwood Hill Road intersection and tips over to the Nith River, maintaining existing flow conditions.

Figure 9 shows the cross-section of the proposed SWM pond. The figure shows the ponding depths at different storm events.

Tributary 4 (Catchment 104) drains to the existing culvert to the east of the site, which discharges to a watercourse that drains to the Roth West Drain. In post-development conditions, the area that drains towards this outlet (Catchment 504) has been reduced. Therefore, the post-development peak flows to the Roth West Drain are significantly lower than the pre-development peak flows. Table 11 compares the peak flows to the Roth West Drain. As with flows to Tributary 3, peak flow rates are decreased. It is anticipated that the Drain Report needed to accommodate the change of use will be administrative in nature due to the decrease in catchment area and flows.

Event/Condition	5-year (m^3/s)	100-year (m^3/s)
Pre-development (Catchment 104)	0.267	0.895
Post-development (Catchment 504)	0.209	0.413

Table 11: Comparison of Peak Flows to Roth West Drain (Tributary 4)



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DRAWING: 1949 Gerber Road
SWM Pond Cross-Section

DRAWN BY: MS/JP	CHECKED BY: CHT	SCALE: NTS	Figure 9
FILE NAME: 4599-SWM Figure.pdf	DATE: May 20, 2026		

Grading and Drainage

The site is proposed to drain from north-east to south-west, allowing the overland flow of most of the site to be directed into the stormwater management block. Lots along the east and south-east of the site are proposed to be back-splits or walkouts to account for the elevation differences between the existing property line and proposed road elevations. The commercial block is raised to ensure drainage into the stormwater management pond, and a 3:1 slope is proposed along the south and west sides of the commercial block to match the existing right-of-way grades.

A drainage split is proposed, dividing the east and west portions of the site, allowing for the overflow drainage to be directed to the SWM facility separately.

The low point elevation in front of the SWM block was set to ensure the minimum standard sanitary cover, and the remaining streets were graded accordingly with a minimum 0.8% slope to provide the necessary overflow drainage across the entire site and adequate cover to the sanitary sewer.

A preliminary earthworks calculation was completed using the proposed concept elevations. Based on the current grading design and assuming a topsoil stripping depth of 0.3m and standard pre-grade depths, it is expected that the site can be balanced. A detailed earthworks analysis will be completed once topsoil depths are confirmed and the pre-grade is defined in greater detail.

Transportation

A Traffic Impact Study will be prepared by others.

Utilities

The following utility companies have responded with their ability to service the development:

- Enova
  - Enova has provided comments. The hydro plans will be designed at a later stage, once the 1st submission package is complete.
- Canada Post
  - Canada Post has provided comments. Locations of the pads will be finalized at a later stage.
- Bell Canada
  - Bell Canada has provided comments. Utilities plan will be designed at a later stage.

The following utility companies will be contacted at a later stage:

- Rogers Cable
- Enbridge Gas
- Mornington

Conclusions

Future iterations of the design should incorporate the conclusions and recommendations stemming from this report.

Capacity at the Wastewater Treatment Plant and in the Firella Creek trunk sanitary sewer system is planned to be expanded for future urban growth.

The existing sanitary outlets have some capacity for the site. The Parkview Drive outlet is proposed to accept sewerage from some lots; the existing Gerber Meadows outlet has sufficient capacity to either accept drainage from all the Phase 1 residential lots or the commercial block's flows plus approximately half of the Phase 1 lots. A new sewer on Gerber Road is proposed for the remaining development lands.

An increase in water supply capacity is planned by examining capacity increase at the existing Wellesley wells and potential new wells, along with a new storage facility on the Bill Gies Recreation Centre lands.

Watermain will be connected to the existing mains at Gerber Meadows Drive. Pipe sizing, hydrant placement and system configuration will be confirmed.

The proposed storm sewer system will capture runoff and route it to the proposed stormwater management pond.

The stormwater management plan includes a forebay and a wet pond to attenuate various storm events and provide quality control. The outlet configuration ensures controlled conveyance to the Nith River, maintaining adequate drainage and downstream flow conditions. A safe overland flow route will be provided for the Regional storm event.

As native soils are not conducive to infiltration, a water balance is not feasible, and infiltration is not recommended.

Recommendations

The required width of the widening along Gerber Road should be confirmed.

A portion of the proposed sanitary system should outlet to the existing sewers on Parkview Drive. A new sanitary sewer should be constructed on Gerber Road to allow for the remaining site to have an outlet to the wastewater treatment plant without exceeding the capacity of existing sewers.

Updated water modelling from the Region of Waterloo should be requested, showing a preliminary internal looped configuration to confirm fire flows, pipe sizes and fire wall requirements.

Storm connections should be provided to each lot/building/unit and connect to the internal storm sewer discharging into the SWM facility which discharges across Gerber Road and into the Nith River.

A geotechnical and hydrogeological investigation is underway and will confirm groundwater elevations and soil types.

Approval agencies shall review this document as a suitable approach to service the site in support of a Draft Plan of Subdivision application and a zoning by-law amendment.

References

AECOM, Municipal Servicing Report; Village Estates VI, Wellesley, Ontario
May 2017

Ministry of the Environment, Stormwater Management Planning & Design Manual
March 2003

Appendix A: Draft Plan

DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION

Part of Lot 11, Concession 1, East Section
Township of Wellesley
Regional Municipality of Waterloo

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

Date: _____ _____
Client Name
Company Name

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

Date: _____ _____
J. Patrick Harms, Surveyor, O.L.S.
J.D. BARNES LIMITED

KEY PLAN



Subject Lands
Additional Lands Owned by Applicant

Scale: 1:30,000

ADDITIONAL INFORMATION
Required Under Section 51 (17) of the Planning Act, R.S.O., 1990, c.P.13 as Amended

(a) As Shown
(b) As Shown
(c) As Shown
(d) Residential, Commerical/Mixed Use
(e) As Shown
(f) As Shown
(g) As Shown
(h) Municipal Water supply
(i) Loam
(j) As Shown
(k) All Services as Required
(l) As Shown

AREA SCHEDULE

DESCRIPTION	LOTS/BLOCKS	UNITS	AREA
Residential	1-5	115-185	3.888 ha
Commercial	6		3.051 ha
Park	7		1.086 ha
Stormwater Management	8		2.900 ha
Roads			2.192 ha
Total	**8**	**115-185**	**13.117 ha**

NOTES

1. All dimensions are in metres unless otherwise shown.
2. Survey and Topographic information provided by J.D. BARNES LTD. - Nov. 2025.
3. Contains information licensed under the Open Government Licence - Ontario.

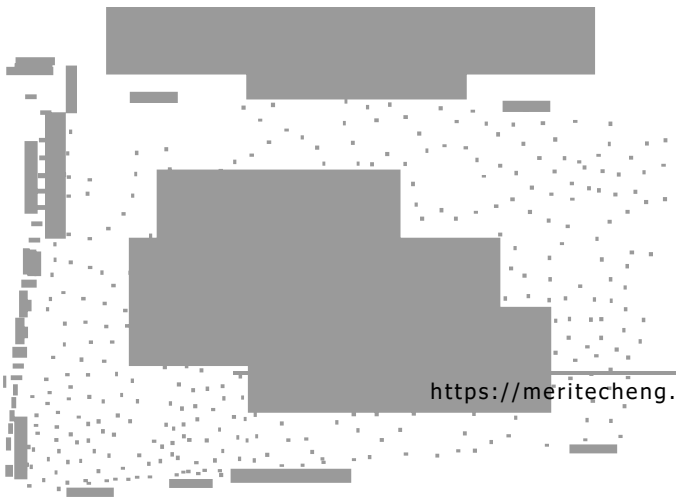
Revision No.	Date	Issued / Revision	By

Stamp	**Date** May 11, 2026
	File No. 25133D
	Plan Scale 1:1250 (Arch D)
	Drawn By SP
	Checked By D.A.
Project GIES 1949 Gerber Road Wellesley, ON	
File Name DRAFT PLAN OF SUBDIVISION	**Dwg No.** 1 of 1
Scale Bar 0 10 25 50 75 100	

K:\25133D - 1949 Gerber Road, Wellesley\DP\25133D_Draft Plan_11May2026.dwg

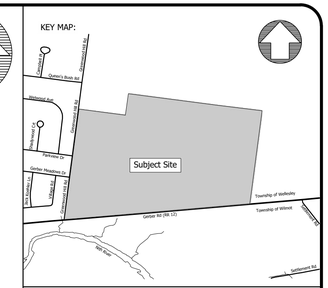
MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

Appendix B: Conceptual Design Drawings





KEY MAP:



Project Notes

1. Only drawings stamped "Issued for Construction" shall be used for construction.
2. This drawing is to be read in conjunction with the standard notes, specifications and details shown on Meritech dwg 4599-1 and the following additional information:
   a. Draft Plan by MHBC Planning, dated May 2026.
   b. Geotechnical Report by << >>, dated <<Mmm yyyy>>.
   c. Preliminary Servicing and SWM Report by Meritech, dated May 2026.
3. Survey and elevations:
   a. Topographic survey completed by J.D. Barnes, dated Nov 2025.
   b. Inverts denotes with "±" are taken from the Village Estates Subdivision, Phase IV plans created by AECOM, dated Jan 2017, and are considered approximate only.
   c. Geodetic reference elevation: CGVD-1928:1978 derived from GNSS observations and Natural Resources Canada's geoid model HT2.0.
   d. Local reference elevation:
      d.a. Local BM #1: Tip of painted chevron located along the edge of asphalt road near the northwestern most corner of the subject property along Greenwood Hill Rd; Approximately 3.5m west of an utility pole. Elev=365.37
      d.b. Local BM #2: Cut cross located in the gutter at the southwesterly corner of the subject property at the junction of Gerber Rd and Greenwood Hill Rd. Elev=355.02

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Information shown on this plan is compiled from various sources, and is believed to be true and accurate. Meritech Engineering has attempted to verify, where possible, all information. The Contractor is responsible for verifying all data and information relative to this project, and indicate any discrepancies to the Engineer prior to commencement of work. Failure to do so will rest sole responsibility of said discrepancies on the Contractor.

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No.	REVISION/ISSUE	DATE	BY
10.			
9.			
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

OWNER:
James Gies Construction Ltd.

LOCATION:
Township of Wellesley

PROJECT:
1949 Gerber Road (RR 12)
Lot 11, Concession 1

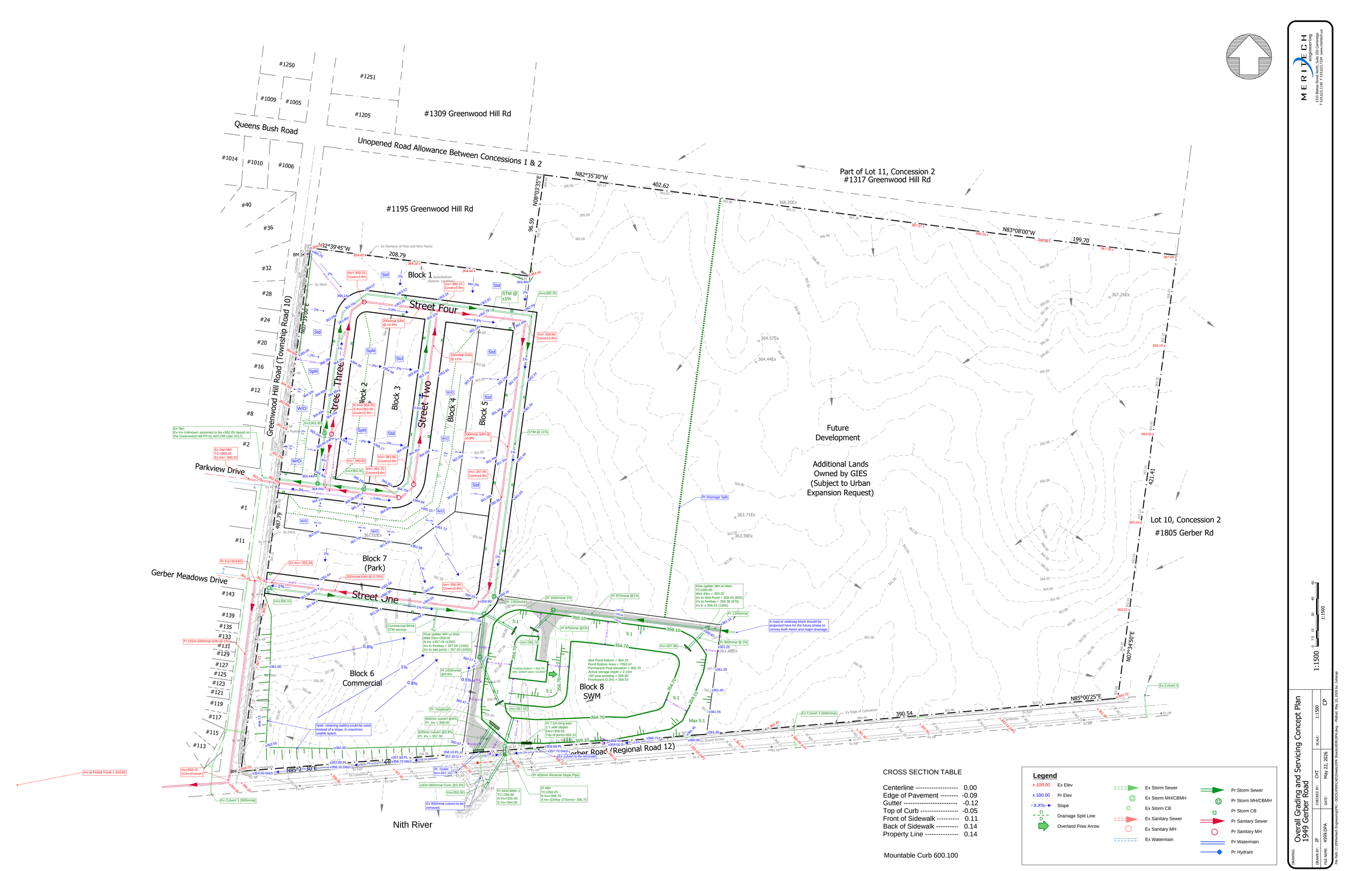
Drawing Title:
Baseplan

Design By:	JP	Checked By:	CHT
Drawn By:	JP	Date:	May 7, 2026

Drawing: 4599-BP

Scale: 1:1500 (0 7.5 15 30 45 60)

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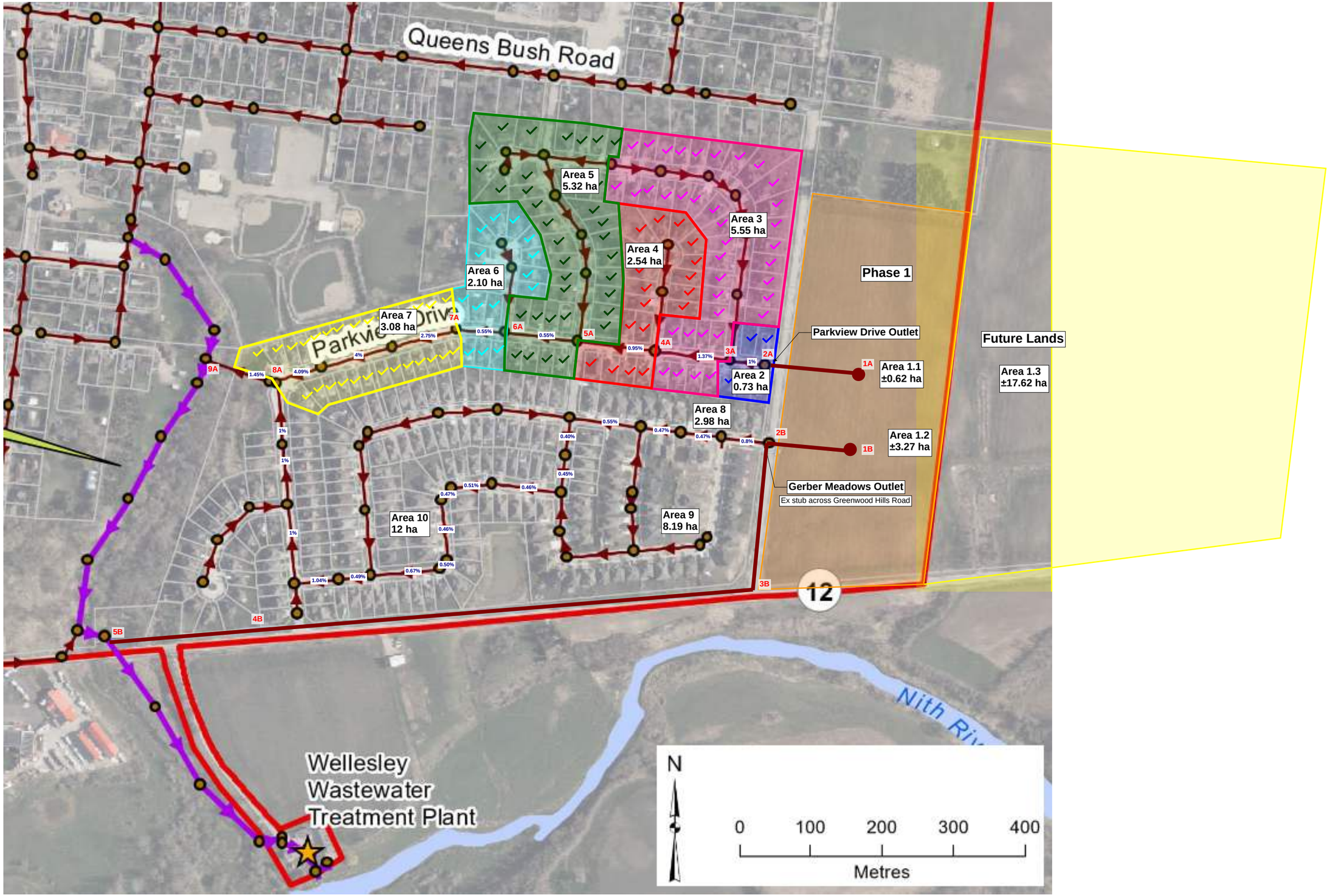


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DRAWING: Overall Grading and Servicing Concept Plan
1949 Gerber Road

DRAWN BY:	JP	CHKD BY:	CHT
FILE NAME:	4595.DPA	DATE:	May 22, 2026
		SCALE:	1:1500
			CP

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0 25 50 100 150 200

DRAWING: Sanitary Drainage Area Plan
1949 Gerber Road

DRAWN BY: JP	CHECKED BY: CHT	SCALE:	
FILE NAME: 4599.SAN Areas	DATE: May 20, 2026		

Appendix C: Calculations

Sanitary Design
RMOW water modelling
Average Day Domestic Design
Firefighting Demands
Storm Design
Forebay Design

MERITECH

Sanitary Sewer Design Sheet

for

Township of Wellesley

Project: 1949 Gerber Road
File: 4599
Calc'd by: JP
Date: 19-May-26
Chk'd by: MS
Date: 20-May-26

Pipe Velocities: 0.60 m/s min. (pipe full) *(MECP CLI-ECA design criteria)*
3.00 m/s max. (actual flow) *(MECP CLI-ECA design criteria)*
n= 0.013 all pipe material

Residential average daily flow (q): 275 L/cap/d *(B.3.1.2.1 from SSMS)*

Unit extraneous flow (E): 0.25 L/s/ha *(B.3.1.2.6 from SSMS)*

q = average daily per capita flow (L/cap/d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
M = 1 + 14/(4+(P/1000)^0.5)
Q(p) = (P/1000)qM/86.4 (L/s)
Q(I) = IA (L/s) ; where A = Area in hectares
Q(d) = Q(p) + Q(I) (L/s)

Peaking Factor: 2.5

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coeffiecient

Location		Unit Count (ppu)			Zoning (p/ha)	Residential 0.0032 (L/s/cap)						Commercial 1.25			Infiltration 0.25				Pipe							
						Individual		Accumulative		Peak	Pop.															
From	To	3.25 Single Semi	2.44 Town	Area ID	Density (pph)	P (person)	Area (ha)	P (person)	Area (ha)	Factor M	Q(p) (L/s)	Comm Area	Accum Area	Peak Flow (L/s)	Total Area	Accum Total Area	Extran. Q(I) (L/s)	Design Q(d) (L/s)	Length L (m)	Size D (mm)	Pipe Mat'l	Slope S (%)	Capacity Qcap. (L/s)	Velocity V (m/s)	Q(d)/Qcap	Actual Velocity (m/s)
Phase 1																										
Parkview Drive																										
1A	2A			1.1	116	72	0.62	72	0.62	4.280	0.981				0.620	0.620	0.155	1.136		200	PVC	0.50%	24.198	0.746	4.7%	0.403
2A	*3A*	*5*	*0*	*2*	*0*	*17*	*0.73*	*89*	*1.35*	*4.257*	*1.206*				*0.730*	*1.350*	*0.338*	*1.543*		*200*	*PVC*	*1.00%*	*34.221*	*1.055*	*4.5%*	*0.570*
3A	*4A*	*37*	*0*	*3*	*0*	*121*	*5.55*	*210*	*6.90*	*4.140*	*2.767*				*5.550*	*6.900*	*1.725*	*4.492*		*200*	*PVC*	*1.37%*	*40.055*	*1.235*	*11.2%*	*0.858*
4A	*5A*	*18*	*0*	*4*	*0*	*59*	*2.54*	*269*	*9.44*	*4.098*	*3.509*				*2.540*	*9.440*	*2.360*	*5.869*		*200*	*PVC*	*0.95%*	*33.355*	*1.028*	*17.6%*	*0.807*
5A	*6A*	*36*	*0*	*5*	*0*	*117*	*5.32*	*386*	*14.76*	*4.029*	*4.951*				*5.320*	*14.760*	*3.690*	*8.641*		*200*	*PVC*	*0.55%*	*25.379*	*0.782*	*34.0%*	*0.728*
6A	*7A*	*16*	*0*	*6*	*0*	*52*	*2.10*	*438*	*16.86*	*4.003*	*5.581*				*2.100*	*16.860*	*4.215*	*9.796*		*200*	*PVC*	*0.55%*	*25.379*	*0.782*	*38.6%*	*0.747*
7A	*8A*	*28*	*0*	*7*	*0*	*91*	*3.08*	*529*	*19.94*	*3.962*	*6.670*				*3.080*	*19.940*	*4.985*	*11.655*		*200*	*PVC*	*1.76%*	*45.399*	*1.400*	*25.7%*	*1.218*
Gerber Meadows																										
1B	2B			1.2	116	380	3.27	380	3.27	4.033	4.877	3.05	3.05	3.813	6.320	6.320	1.580	10.270		200	PVC	0.40%	21.643	0.667	47.5%	0.667
2B	*3B*	*25*	*0*	*8*	*0*	*82*	*2.98*	*462*	*6.25*	*3.992*	*5.870*		*3.05*	*3.813*	*2.980*	*9.300*	*2.325*	*12.007*		*200*	*PVC*	*0.47%*	*23.461*	*0.723*	*51.2%*	*0.738*
3B	*4B*	*69*	*0*	*9*	*0*	*225*	*8.19*	*687*	*14.44*	*3.899*	*8.526*		*3.05*	*3.813*	*8.190*	*17.490*	*4.373*	*16.711*		*200*	*PVC*	*0.46%*	*23.210*	*0.716*	*72.0%*	*0.784*
4B	*8A*	*104*	*0*	*10*	*0*	*338*	*12.00*	*1025*	*26.44*	*3.793*	*12.375*		*3.05*	*3.813*	*12.000*	*29.490*	*7.373*	*23.560*		*200*	*PVC*	*0.46%*	*23.210*	*0.716*	*101.5%*	*0.823*
Future Development:																										
Phase 1 Lands				1.2	116	380	3.27	380	3.27	4.033	4.877	3.05	3.05	3.813	6.320	6.320	1.580	10.270		200	PVC	0.75%	29.636	0.914	34.7%	0.850
Future Lands				1.3	116	2046	17.62	2046	17.62	3.578	23.301				17.620	17.620	4.405	27.706		250	PVC	0.75%	53.734	1.060	51.6%	1.082
Gerber Road																										
							3.27	380	3.27																	
							17.62	2046	17.62																	
1B	5B						20.89	2426	20.89	3.519	27.173	3.05	3.05	3.813	23.940	23.940	5.985	36.971		250	PVC	0.70%	51.912	1.024	71.2%	1.122
Outlet to Trunk																										
1A	8A						0.62	72	0.62																	
1B	5B						20.89	2426	20.89																	
Total site to trunk							21.51	2498	21.51	3.509	27.897	3.05	3.05	3.813	24.560	24.560	6.140	37.850		250	PVC	1.45%	74.714	1.474	50.7%	1.496

Region of Waterloo

ENGINEERING AND ENVIRONMENTAL SERVICES
Water and Wastewater Services
150 Frederick Street 7th Floor
Kitchener Ontario N2G 4J3 Canada
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www.regionofwaterloo.ca/water

Sarah Kerr
Meritech Engineering
1315 Bishop Street North, Suite 202
Cambridge ON N1R 6Z2
519.623.1104 x 206 | saragk@meritech.ca

Date: April 17, 2026

Dear: Sarah Kerr

Re: 1949 Gerber Road, Wellesley

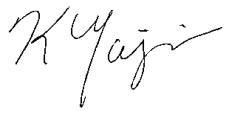
Please find the results of the modeling simulations for boundary conditions requested on December 18, 2025. As there were no servicing plans provided at this time, the model results provided are boundary conditions with no additional demand. The results include a figure showing the location of the node from the Region's model. Attached are a series of spreadsheets containing results for Average Day, Maximum Day demands and available fire flows for nodes JCT_10163, JCT_10108, JCT_10267 located on Greenwood Hill Rd off Queen's Bush Rd, Parkview Dr and Gerber Meadows Dr. The diurnal 24-hour demand distribution accounts for the minimum hour and peak hour peaking factors. The maximum pressure on the average day represents the minimum hour, and the minimum pressure on the maximum day represents the peak hour.

Table 1 – Modeling Results

Node	Elevation (mASL)	Demand		Fire Flow Results	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_10163	365.00	0.09	0.14	133.24	14.88
JCT_10109	363.00	0.01	0.02	105.61	14.00
JCT_10267	361.00	0.03	0.05	95.41	14.00

A fire flow analysis shows the maximum flow available at a node with an associated design pressure during the maximum day scenario while maintaining the minimum design pressure of 14 m (140 kPa) at all nodes within the pressure zone.

If you have any questions, please contact me.



Kaoru Yajima, P.Eng.

Manager, Engineering & Planning Group | Engineering and Environmental Services

Cell: 226-753-0065 | KYajima@regionofwaterloo.ca

Wellesley Greenwood Hill Rd and Queen's Bush Rd

JCT_10163 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.05	405.88	40.88
01:00 hrs	0.05	405.87	40.87
02:00 hrs	0.05	405.86	40.86
03:00 hrs	0.06	405.86	40.86
04:00 hrs	0.06	405.86	40.86
05:00 hrs	0.07	405.84	40.84
06:00 hrs	0.09	405.79	40.79
07:00 hrs	0.10	405.77	40.77
08:00 hrs	0.10	405.75	40.75
09:00 hrs	0.10	405.76	40.76
10:00 hrs	0.10	405.77	40.77
11:00 hrs	0.09	405.79	40.79
12:00 hrs	0.09	405.78	40.78
13:00 hrs	0.08	405.80	40.80
14:00 hrs	0.08	405.80	40.80
15:00 hrs	0.08	405.80	40.80
16:00 hrs	0.09	405.78	40.78
17:00 hrs	0.10	405.76	40.76
18:00 hrs	0.12	405.72	40.72
19:00 hrs	0.12	405.69	40.69
20:00 hrs	0.12	405.70	40.70
21:00 hrs	0.10	405.77	40.77
22:00 hrs	0.07	405.83	40.83
23:00 hrs	0.05	405.86	40.86
Average Day HGL:		405.80	
Minimum Hour:		405.88	

JCT_10163 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.08	405.83	40.83
01:00 hrs	0.08	405.82	40.82
02:00 hrs	0.09	405.79	40.79
03:00 hrs	0.09	405.78	40.78
04:00 hrs	0.09	405.78	40.78
05:00 hrs	0.11	405.73	40.73
06:00 hrs	0.14	405.59	40.59
07:00 hrs	0.16	405.54	40.54
08:00 hrs	0.17	405.50	40.50
09:00 hrs	0.17	405.50	40.50
10:00 hrs	0.16	405.53	40.53
11:00 hrs	0.15	405.58	40.58
12:00 hrs	0.15	405.58	40.58
13:00 hrs	0.14	405.61	40.61
14:00 hrs	0.14	405.63	40.63
15:00 hrs	0.14	405.62	40.62
16:00 hrs	0.15	405.58	40.58
17:00 hrs	0.17	405.50	40.50
18:00 hrs	0.19	405.42	40.42
19:00 hrs	0.19	405.40	40.40
20:00 hrs	0.19	405.43	40.43
21:00 hrs	0.17	405.55	40.55
22:00 hrs	0.12	405.69	40.69
23:00 hrs	0.09	405.79	40.79
Maximum Day HGL:		405.61	
Peak Hour:		405.40	

Available Flow (L/s)	Residual Pressure (m)
0.0	55.6
10.0	55.2
20.0	53.7
30.0	52.0
40.0	49.9
50.0	47.2
60.0	44.2
70.0	41.1
80.0	37.5
90.0	33.7
100.0	29.8
110.0	25.8
120.0	21.6
130.0	16.9
133.2	14.9

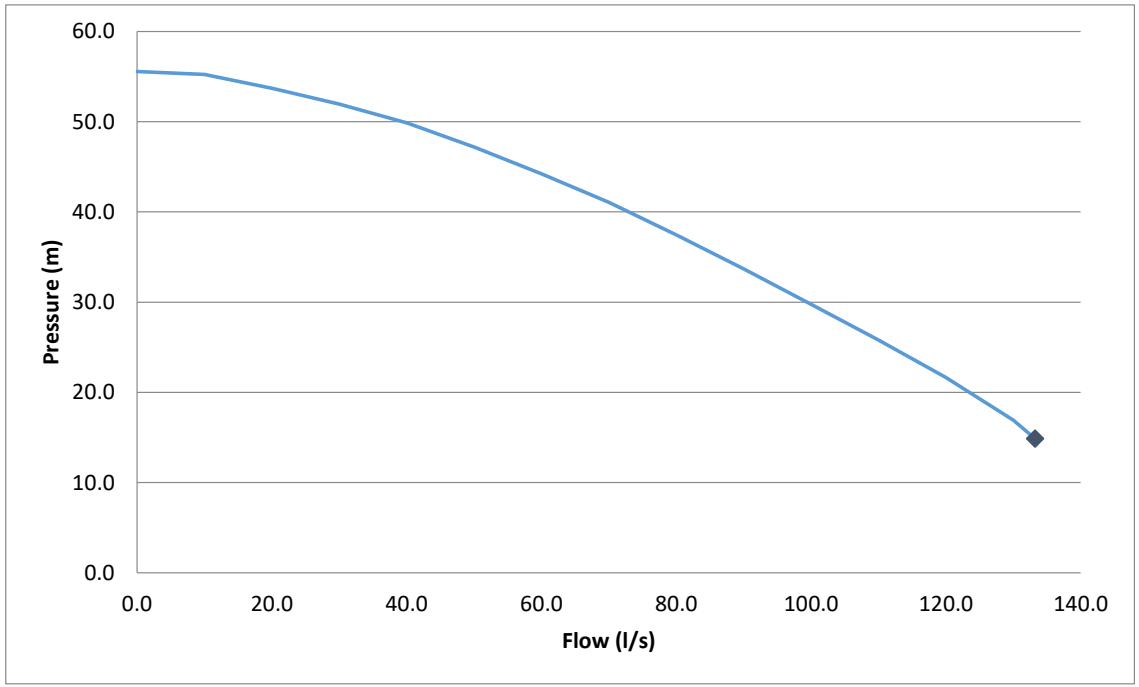
Fire Flow Analysis

Fire Flow Node:	JCT_10163
Design Flow (L/s):	133.2
Design Pressure (m):	14.9

Design Flow: *The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*



Wellesley Greenwood Hill Rd and Parkview Dr

JCT_10109 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.01	405.88	42.88
01:00 hrs	0.01	405.87	42.87
02:00 hrs	0.01	405.86	42.86
03:00 hrs	0.01	405.86	42.86
04:00 hrs	0.01	405.86	42.86
05:00 hrs	0.01	405.84	42.84
06:00 hrs	0.01	405.79	42.79
07:00 hrs	0.02	405.77	42.77
08:00 hrs	0.02	405.75	42.75
09:00 hrs	0.02	405.76	42.76
10:00 hrs	0.02	405.77	42.77
11:00 hrs	0.01	405.79	42.79
12:00 hrs	0.01	405.78	42.78
13:00 hrs	0.01	405.80	42.80
14:00 hrs	0.01	405.80	42.80
15:00 hrs	0.01	405.80	42.80
16:00 hrs	0.01	405.78	42.78
17:00 hrs	0.02	405.76	42.76
18:00 hrs	0.02	405.72	42.72
19:00 hrs	0.02	405.69	42.69
20:00 hrs	0.02	405.70	42.70
21:00 hrs	0.02	405.77	42.77
22:00 hrs	0.01	405.83	42.83
23:00 hrs	0.01	405.86	42.86
Average Day HGL:		405.80	
Minimum Hour:		405.88	

JCT_10109 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.01	405.83	42.83
01:00 hrs	0.01	405.82	42.82
02:00 hrs	0.01	405.79	42.79
03:00 hrs	0.01	405.78	42.78
04:00 hrs	0.01	405.78	42.78
05:00 hrs	0.02	405.73	42.73
06:00 hrs	0.02	405.59	42.59
07:00 hrs	0.03	405.54	42.54
08:00 hrs	0.03	405.50	42.50
09:00 hrs	0.03	405.50	42.50
10:00 hrs	0.03	405.53	42.53
11:00 hrs	0.02	405.58	42.58
12:00 hrs	0.02	405.58	42.58
13:00 hrs	0.02	405.61	42.61
14:00 hrs	0.02	405.63	42.63
15:00 hrs	0.02	405.62	42.62
16:00 hrs	0.02	405.58	42.58
17:00 hrs	0.03	405.51	42.51
18:00 hrs	0.03	405.42	42.42
19:00 hrs	0.03	405.40	42.40
20:00 hrs	0.03	405.43	42.43
21:00 hrs	0.03	405.56	42.56
22:00 hrs	0.02	405.69	42.69
23:00 hrs	0.01	405.79	42.79
Maximum Day HGL:		405.62	
Peak Hour:		405.40	

Available Flow (L/s)	Residual Pressure (m)
0.0	57.6
10.0	57.0
20.0	55.0
30.0	52.4
40.0	49.3
50.0	45.3
60.0	40.7
70.0	35.8
80.0	30.1
90.0	24.1
100.0	17.7
105.6	14.0

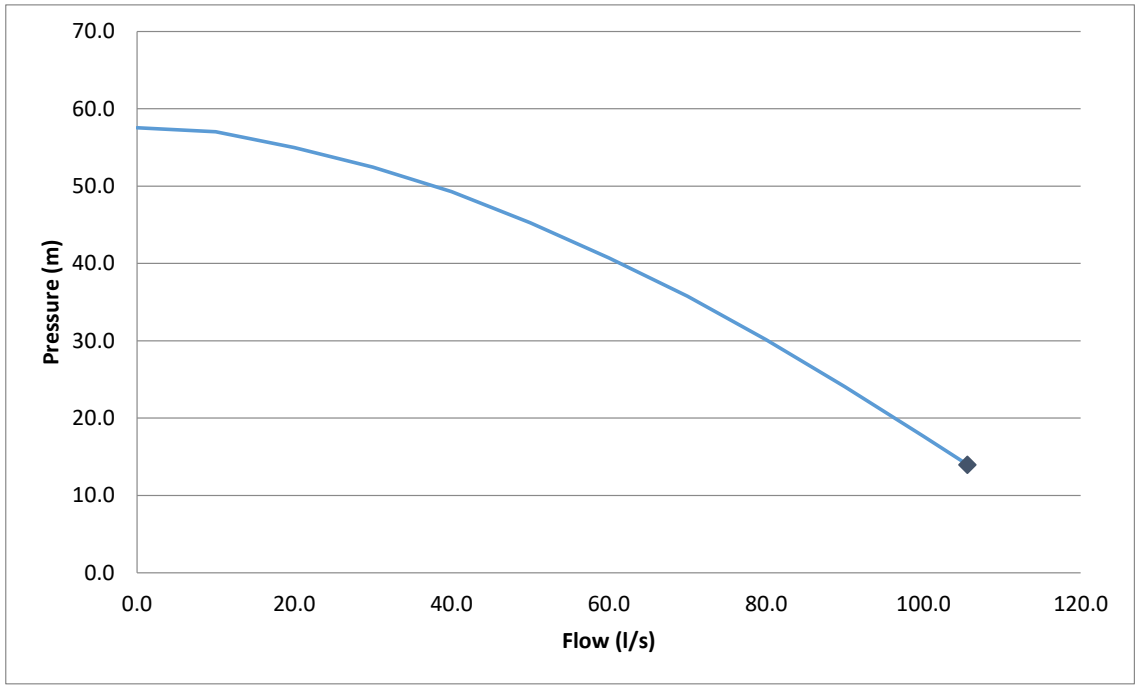
Fire Flow Analysis

Fire Flow Node:	JCT_10109
Design Flow (L/s):	105.6
Design Pressure (m):	14.0

Design Flow: *The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*



Wellesley Greenwood Hill Rd and Gerber Meadows Dr

JCT_10267 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.02	405.88	44.88
01:00 hrs	0.02	405.87	44.87
02:00 hrs	0.02	405.86	44.86
03:00 hrs	0.02	405.86	44.86
04:00 hrs	0.02	405.86	44.86
05:00 hrs	0.02	405.84	44.84
06:00 hrs	0.03	405.79	44.79
07:00 hrs	0.03	405.77	44.77
08:00 hrs	0.03	405.75	44.75
09:00 hrs	0.03	405.76	44.76
10:00 hrs	0.03	405.77	44.77
11:00 hrs	0.03	405.79	44.79
12:00 hrs	0.03	405.78	44.78
13:00 hrs	0.03	405.80	44.80
14:00 hrs	0.03	405.80	44.80
15:00 hrs	0.03	405.80	44.80
16:00 hrs	0.03	405.78	44.78
17:00 hrs	0.03	405.76	44.76
18:00 hrs	0.04	405.72	44.72
19:00 hrs	0.04	405.69	44.69
20:00 hrs	0.04	405.70	44.70
21:00 hrs	0.03	405.78	44.78
22:00 hrs	0.02	405.83	44.83
23:00 hrs	0.02	405.86	44.86
Average Day HGL:		405.80	
Minimum Hour:		405.88	

JCT_10267 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.03	405.83	44.83
01:00 hrs	0.03	405.82	44.82
02:00 hrs	0.03	405.79	44.79
03:00 hrs	0.03	405.78	44.78
04:00 hrs	0.03	405.78	44.78
05:00 hrs	0.04	405.73	44.73
06:00 hrs	0.05	405.59	44.59
07:00 hrs	0.05	405.54	44.54
08:00 hrs	0.06	405.50	44.50
09:00 hrs	0.06	405.50	44.50
10:00 hrs	0.05	405.53	44.53
11:00 hrs	0.05	405.58	44.58
12:00 hrs	0.05	405.58	44.58
13:00 hrs	0.05	405.61	44.61
14:00 hrs	0.05	405.63	44.63
15:00 hrs	0.05	405.62	44.62
16:00 hrs	0.05	405.58	44.58
17:00 hrs	0.06	405.51	44.51
18:00 hrs	0.06	405.42	44.42
19:00 hrs	0.06	405.40	44.40
20:00 hrs	0.06	405.43	44.43
21:00 hrs	0.06	405.56	44.56
22:00 hrs	0.04	405.69	44.69
23:00 hrs	0.03	405.79	44.79
Maximum Day HGL:		405.62	
Peak Hour:		405.40	

Available Flow (L/s)	Residual Pressure (m)
0.0	59.6
10.0	58.9
20.0	56.5
30.0	53.4
40.0	49.5
50.0	44.6
60.0	39.1
70.0	32.9
80.0	25.9
90.0	18.3
95.4	14.0

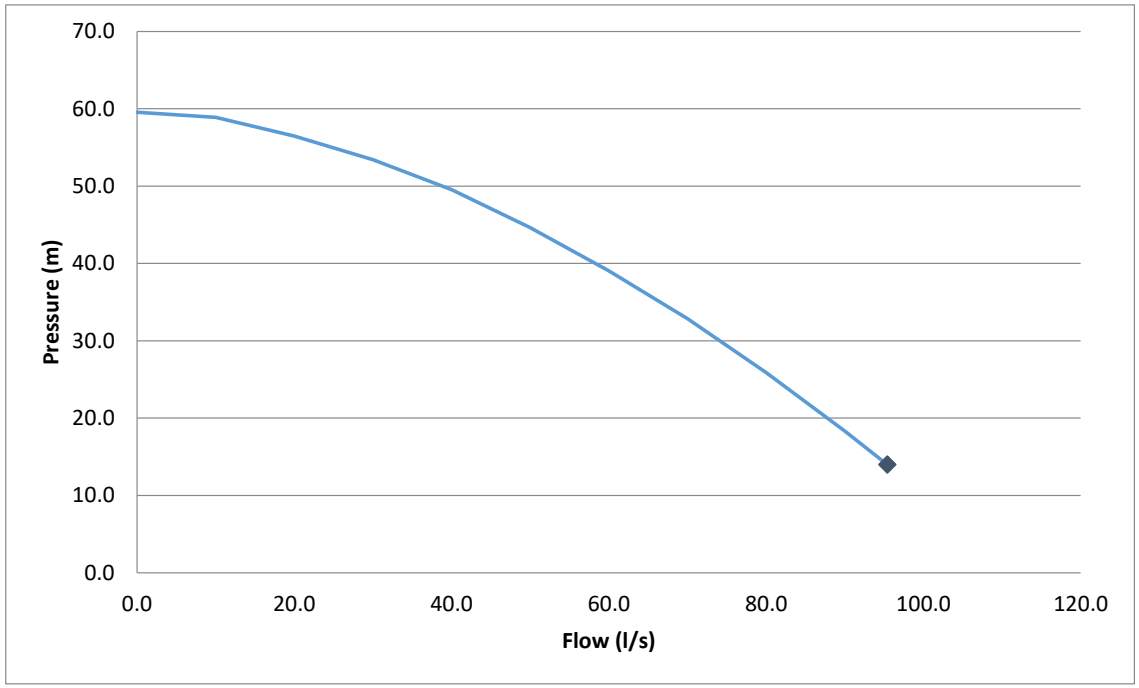
Fire Flow Analysis

Fire Flow Node:	JCT_10267
Design Flow (L/s):	95.4
Design Pressure (m):	14.0

Design Flow: *The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*



Water Demand Calculations
Township of Wellesley

Project: 1949 Gerber Road
File: 4599
Designed by: JP
Date: 20-May-26
Checked by: CHT
Date: 23-May-26

Node	Elevation (m)	Area (ha)	Pop. Density (ppl/ha)	Node Type	# of Units	Pop. Density (ppl/unit)	Pop.	Demand (l/c/d)	Demand (l/sec)
Phase 1				Towns	185	2.44	452	225	1.177
Future Lands				Towns	840	2.44	2050	225	5.339
				Totals	1025	-	2502	-	6.516

Fire Flow Calculations

1999 Fire Underwriters Survey (FUS) Method

Project: Gerber Road
File: 4599
Calculated by: JP
Date: 12-May-26
Checked by: CHT
Date: 23-May-26

Preliminary Townhouses

Buildings require a sufficient amount of water, based on the FUS, for fire fighting purposes.
The required fire flow (L/minute) is expressed by the equation:

where **C =** Coefficient related to the type of construction.
A = Floor area (m²)

$$F = 220 \cdot C \cdot \sqrt{A}$$

A)	**Building structure 'C'**	**=**	1.5
B)	**A (m²)**	**=**	200.00
C)	**# Floors (excl. basement)**		2
D)	**F (L/min)**	**=**	6600
	Rounded	**=**	**7000**

E) Type of occupancy/contents

○ Non-Combustible ○ Free Burning
◉ Limited Combustible ○ Rapid Burning
○ Combustible

Fire hazard adjustment	**=**	-15%
Adjustment	**=**	**-1050**
F_{adj} (L/min)		**5950**

F) % reduction based on sprinkler system effectiveness **=** 0.00%
Reduction **-** **0**

G)

	Distance to nearest building (m)	% addition
N	15.0	15%
E	Fire Wall	10%
S	32.0	5%
W	3.0	25%

% addition based on building separation **=** 55%
Addition **+** **3273**

H)	**Total Fire Flow**	**=**	9223	L/min
		=	**154**	**L/sec**

Fire Fighting Supply

Project Name:	1949 Gerber Road	Calculated By:	JP	Checked By:	CHT
Project #:	4599	Date:	12-May-26	Date:	May 23

Building requires an on-site water supply, based on the criteria set by the OBC, that is available for fire fighting purposes not less than the amount derived from the following equation:

$$Q = K \cdot V \cdot S_{tot}$$

where **K** = water supply coefficient
V = total building volume (m³)
Stot = spatial coefficient

K = 23 (OBC, Volume 2, Table 1 of A-3.2.5.7)

Floor Area (m²) = 600.00 **# Floors** 3 **Height of floors (m)** 2.70

V (m³) = 4860.00

Stot = 1.38 (OBC, Figure 1 A-3.2.5.7)

Q (Litres) = 154256.40

Therefore, based on Table 2 of A-3.2.5.7, the required flow rate for this building is:

= 4500 litres/min.

= 75.00 litres/sec.

2012 Ontario Building Code (OBC)
Division B, Section A-3.2.5.7

MERITECH

Storm Sewer Hydraulic Design Sheet

for

Township of Wellesley

Project: 1949 Gerber Road
File: 4599
Calc'd by: JP/MS
Date: 20-May-26
Chk'd by: CHT
Date: 21-May-26

I=A/(Tc+B)^C
A= 1593
B= 11
C= 0.8789
Tc= 15

Pipe Velocities: 0.75 m/s min. *(MECP CLI-EC*
6.0 m/s max. *(MECP CLI-EC*
n= 0.024 CSP
n= 0.013 Conc./PVC/HDPE

5 Year Design Storm

Rational Formula: Q =CIA/0.36
Where: Q : peak flow (L/s)
C : runoff coefficient
I : rainfall intensity (mm/hr)
A : area (ha)

Concentration time: tc = ti + tf (minute)
Where: ti: inlet time before pipe (minute)
tf: time of flow in pipe (minute)
tf = L/60V
ti = 10

Manning Equation:
Qcap.=(D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

Location		Runoff									Pipe								
From	To	Area ID	Area A (ha)	"C"	Section "AC" (ha)	Accum. "AC" (ha)	ti (Min.)	tc (Min.)	"I" (mm/hr)	Peak Flow Q (L/s)	Length L (m)	N.D. D (mm)	Pipe Mat'l	Slope S (%)	Qcap. (full) (L/s)	V (full) (m/s)	tf (Min.)	Q/Qcap.	Actual Velocity (m/s)
Subdivision																			
External flows from the north		1	6.11	0.25	1.528	1.528													
Commercial Block		2	3.05	0.80	2.440	2.440													
Site (West)	Flowsplitter MH	3	13.55	0.70	9.485	13.453	10.00	13.80	109.677	4098.43	850.0	1350	Concrete	1.00%	5337.402	3.729	3.80	77%	4.139
Flow splitter MH to Forebay - 25mm storm																			
										2076	30.0	1050	Concrete	1.00%	2730.725	3.154	0.16	76%	3.501
Flow splitter MH to Wet Pond																			
										2022.43	90.0	1050	Concrete	0.60%	2115.211	2.443	0.61	96%	2.821
Site (East)	Flowsplitter MH	4	19.75	0.70	13.825	13.825	10.00	14.02	109.677	4211.92	900.0	1350	Concrete	1.00%	5337.402	3.729	4.02	79%	4.158
Flow splitter MH to Forebay - 25mm storm																			
										2132	168.0	975	Concrete	1.00%	2241.053	3.002	0.93	95%	3.467
Flow splitter MH to Wet Pond																			
										2079.92	25.0	900	Concrete	2.00%	2560.167	4.024	0.10	81%	4.507
						100-year peakflow from SWM facility (MIDUSS)													
Culvert to Watercourse										*2545*	35.0	900	Concrete	3.30%	3288.594	5.169	0.11	77%	5.738

Project Name: 1949 Gerber Rd.
Project Number: 4599
Calc'd by: MS
Date: 20-May-26
Chk'd by: CHT
Date: 25-May-26

Sediment Forebay Sizing Calculations

(in accordance with MOE 2003)
Township of Wellesley

Forebay Dimensions

				Calculated min.	Actual	
Average bottom width	**20.0**	m	Average top width	**40.0**	**40.5**	m
Maximum bottom width	**25.0**	m	Maximum top width	**45.0**	**46.0**	m
Average bottom length	**56.5**	m	Average top length	**76.5**	**77.0**	m
Average depth	**2.00**	m	Total Volume	**3635**	m³	
Average sideslope	**5**	:1	Usable Volume	**2251**	m³	

1) Forebay Settling Length

Dist = forebay length (m)
r = length to width ratio at average depth
= **2.2** (should be greater than 2:1)
Q_p = peak flow rate from facility during design quality storm
= **0.161** m³/s **25mm** storm event
V_s = settling velocity (dependent on particle size)
= **0.0003** m/s for 150 μm particle
Therefore, distance = **34.4** m vs. **77.0** m provided

2) Dispersion Length

Dist = length of dispersion (m)
Q = flowrate into forebay (lesser of actual pipe capacity or 10-year peak runoff rate)
= **4.200** m³/s Pipes sized for: **25mm** storm event
d = depth of the permanent pool above the maximum sediment depth
= **1.000** m
V_f = desired velocity in the forebay
= **0.50** m/s
Therefore, distance = **67.2** m vs. **77.0** m provided
Also, min. bottom width = Dist./8 = **8.4** m vs. **20.0** m provided

3) Check Velocity Across Full Width of Forebay Above Maximum Accumulated Sediment Depth

V_a = average velocity in the forebay (m/s)
Q_i = flowrate into forebay
= **4.200** m³/s **25mm** storm event
A_x = cross sectional area of forebay perpendicular to flow
= **40.5** m² above the maximum sediment depth
Therefore, velocity = V_a = **0.10** m/s should be < than **0.15** m/s

Project Name: 1949 Gerber Rd.
Project Number: 4599
Calc'd by: MS
Date: 20-May-26
Chk'd by: CHT
Date: 25-May-26

Sediment Forebay Sizing Calculations

(in accordance with MOE 2003)
Township of Wellesley

4) Cleanout Interval

V_u = usable accumulation storage volume of forebay at a
max. depth, d_u = **1.00** m
= **1384** m³
L_a = annual loading
for **65.0** % impervious
= **2.500** m³/ha/yr
A_c = **42.700** ha of contributing land
Therefore, interval = I = **13.0** yrs between cleanouts **5.0** years min. preferred

5) 10 year Accumulated Sediment Depth

A_c = contributing area
= **42.700** ha.
L_a = annual loading
= **2.500** m³/ha/yr
I = cleanout interval
= **10** years
V_r = required total storage volume
= **1067.5** m³
Actual total storage volume
= **3634.5** m³

6) Forebay Size in relation to Remainder of Facility

Type of facility: **Wet pond**

Forebay permanent pool **area**	**3119**
Wet pond permanent pool area	**7050**
Forebay's percentage	**31%**
Minimum criteria	**Maximum 33%**
Forebay permanent pool **volume**	**3635**
Wet pond permanent pool volume	**14100**
Forebay's percentage	**20%**
Preferred criteria	**Maximum 20%**

Appendix D: Stormwater Management Modelling

Appendix D.1: Pre-Development Conditions

```
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"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
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"                                                                    60-Design\SWM"
"                Output filename:                          4599x5yr20260520.out"
"                Licensee name:                                   Mithra Sriram"
"                Company                                   Meritech Engineering"
"                Date & Time last used:                2026-05-20 at 9:56:06 AM"
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"           2  Lines of comment"
"              5-year predevelopment MIDUSS for 1949 Gerber Road, "
"              Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32           STORM Chicago storm"
"             1   Chicago storm"
"     1593.000   Coefficient A"
"       11.000   Constant B"
"        0.879   Exponent C"
"        0.375   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"              Maximum intensity           119.727    mm/hr"
"              Total depth                  49.541    mm"
"             6   005hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT==================================================="
"           1  Lines of comment"
"              Flows to Ex Culvert on Greenwood Hill Drive"
" 33           CATCHMENT 101"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           101   Internal catchment (Tributary 1)"
"        0.000   % Impervious"
"        7.970   Total Area"
"      100.000   Flow length"
"        1.500   Overland Slope"
"        7.970   Pervious Area"
"      100.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.531   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.531     0.000     0.000     0.000 c.m/sec"
"              Catchment 101          Pervious   Impervious Total Area "
```

```
"             Surface Area           7.970      0.000      7.970      hectare"
"             Time of concentration  30.825     4.700      30.825     minutes"
"             Time to Centroid       160.399    115.422    160.399    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        3948.39    0.00       3948.40    c.m"
"             Rainfall losses        23.247     5.433      23.247     mm"
"             Runoff depth           26.293     44.107     26.293     mm"
"             Runoff volume          2095.58    0.00       2095.58    c.m"
"             Runoff coefficient     0.531      0.000      0.531      "
"             Maximum flow           0.531      0.000      0.531      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.531     0.531     0.000     0.000"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   External areas"
"        5.000   % Impervious"
"        5.560   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
"        5.282   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"        0.278   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.256   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.874   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.161     0.531     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  31.995     3.502      27.658     minutes"
"             Time to Centroid       167.506    113.828    159.336    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        2616.74    137.72     2754.47    c.m"
"             Rainfall losses        36.848     6.246      35.318     mm"
"             Runoff depth           12.692     43.295     14.222     mm"
"             Runoff volume          670.41     120.36     790.77     c.m"
"             Runoff coefficient     0.256      0.874      0.287      "
"             Maximum flow           0.148      0.081      0.161      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.161     0.687     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.161     0.687     0.687     0.000"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
```

```
"               To Nith River"
"             Maximum flow                  0.687    c.m/sec"
"             Hydrograph volume          2886.350    c.m"
"                    0.161     0.687     0.687     0.687"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.161     0.000     0.687     0.687"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   External area draining to the site"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.531   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.306     0.000     0.687     0.687 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  44.400     6.770      44.400     minutes"
"             Time to Centroid       179.510    118.516    179.510    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        3026.94    0.00       3026.94    c.m"
"             Rainfall losses        23.249     5.653      23.249     mm"
"             Runoff depth           26.291     43.888     26.291     mm"
"             Runoff volume          1606.41    0.00       1606.41    c.m"
"             Runoff coefficient     0.531      0.000      0.531      "
"             Maximum flow           0.306      0.000      0.306      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.306     0.306     0.687     0.687"
" 33          CATCHMENT 102"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          102   Site (Tributary 2)"
"        0.000   % Impervious"
"       15.800   Total Area"
"      100.000   Flow length"
"        1.000   Overland Slope"
"       15.800   Pervious Area"
"      100.000   Pervious length"
"        1.000   Pervious slope"
```

```
"         0.000   Impervious Area"
"       100.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.531   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.953     0.306     0.687     0.687 c.m/sec"
"              Catchment 102          Pervious   Impervious Total Area "
"              Surface Area           15.800     0.000      15.800     hectare"
"              Time of concentration  34.812     5.308      34.812     minutes"
"              Time to Centroid       166.013    116.298    166.013    minutes"
"              Rainfall depth         49.541     49.541     49.541     mm"
"              Rainfall volume        7827.43    0.01       7827.44    c.m"
"              Rainfall losses        23.258     5.427      23.258     mm"
"              Runoff depth           26.282     44.114     26.282     mm"
"              Runoff volume          4152.62    0.01       4152.63    c.m"
"              Runoff coefficient     0.531      0.000      0.531      "
"              Maximum flow           0.953      0.000      0.953      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      0.953     1.248     0.687     0.687"
" 33           CATCHMENT 103"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           103   Site (Tributary 3)"
"         0.000   % Impervious"
"        11.060   Total Area"
"       200.000   Flow length"
"         1.000   Overland Slope"
"        11.060   Pervious Area"
"       200.000   Pervious length"
"         1.000   Pervious slope"
"         0.000   Impervious Area"
"       200.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.531   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.481     1.248     0.687     0.687 c.m/sec"
"              Catchment 103          Pervious   Impervious Total Area "
"              Surface Area           11.060     0.000      11.060     hectare"
"              Time of concentration  52.765     8.046      52.765     minutes"
"              Time to Centroid       191.284    120.286    191.284    minutes"
"              Rainfall depth         49.541     49.541     49.541     mm"
```

```
"             Rainfall volume        5479.20    0.01       5479.21    c.m"
"             Rainfall losses        23.241     5.313      23.241     mm"
"             Runoff depth           26.300     44.227     26.300     mm"
"             Runoff volume          2908.72    0.00       2908.73    c.m"
"             Runoff coefficient     0.531      0.000      0.531      "
"             Maximum flow           0.481      0.000      0.481      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.481     1.692     0.687     0.687"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.481     1.692     1.692     0.687"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                To Nith River"
"             Maximum flow                  2.357    c.m/sec"
"             Hydrograph volume         11554.115    c.m"
"                    0.481     1.692     1.692     2.357"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.481     0.000     1.692     2.357"
" 81          ADD COMMENT================================================="
"          1  Lines of comment"
"             Flow to existing culvert on Gerber Road (east of site) "
" 33          CATCHMENT 104"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          104   Site (Tributary 4)"
"        0.000   % Impervious"
"        4.430   Total Area"
"      100.000   Flow length"
"        1.000   Overland Slope"
"        4.430   Pervious Area"
"      100.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.531   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.267     0.000     1.692     2.357 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           4.430      0.000      4.430      hectare"
"             Time of concentration  34.812     5.308      34.812     minutes"
"             Time to Centroid       166.013    116.297    166.013    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        2194.65    0.00       2194.65    c.m"
"             Rainfall losses        23.258     5.427      23.258     mm"
"             Runoff depth           26.282     44.114     26.282     mm"
```

```
"              Runoff volume          1164.31    0.00       1164.31    c.m"
"              Runoff coefficient     0.531      0.000      0.531      "
"              Maximum flow           0.267      0.000      0.267      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                    0.267     0.267     1.692     2.357"
" 40           HYDROGRAPH Copy to Outflow"
"             8   Copy to Outflow"
"                    0.267     0.267     0.267     2.357"
" 40           HYDROGRAPH   Combine    100"
"             6   Combine "
"           100   Node #"
"                 To Nith River"
"              Maximum flow                  2.621    c.m/sec"
"              Hydrograph volume         12718.432    c.m"
"                    0.267     0.267     0.267     2.621"
" 38           START/RE-START TOTALS 104"
"             3   Runoff Totals on EXIT"
"              Total Catchment area                     50.930    hectare"
"              Total Impervious area                     0.278    hectare"
"              Total % impervious                        0.546"
" 19           EXIT"
```

```
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"                MIDUSS created                                 February 7, 2010"
"           10   Units used:                                             ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                    60-Design\SWM"
"                Output filename:                          4599x100yr20260520.out"
"                Licensee name:                                    Mithra Sriram"
"                Company                                    Meritech Engineering"
"                Date & Time last used:                2026-05-20 at 9:58:20 AM"
" 81           ADD COMMENT=================================================="
"           2  Lines of comment"
"              100-year predevelopment MIDUSS for 1949 Gerber Road, "
"              Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32           STORM Chicago storm"
"             1   Chicago storm"
"     4688.000   Coefficient A"
"       17.000   Constant B"
"        0.962   Exponent C"
"        0.375   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"              Maximum intensity           211.919    mm/hr"
"              Total depth                  90.093    mm"
"             6   100hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT=================================================="
"           1  Lines of comment"
"              Flows to Ex Culvert on Greenwood Hill Drive"
" 33           CATCHMENT 101"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           101   Internal catchment (Tributary 1)"
"        0.000   % Impervious"
"        7.970   Total Area"
"      100.000   Flow length"
"        1.500   Overland Slope"
"        7.970   Pervious Area"
"      100.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.686   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     1.741     0.000     0.000     0.000 c.m/sec"
"              Catchment 101          Pervious   Impervious Total Area "
```

```
"             Surface Area           7.970      0.000      7.970      hectare"
"             Time of concentration  22.072     3.706      22.072     minutes"
"             Time to Centroid       141.202    110.638    141.202    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        7180.42    0.01       7180.43    c.m"
"             Rainfall losses        28.301     7.274      28.301     mm"
"             Runoff depth           61.792     82.819     61.792     mm"
"             Runoff volume          4924.83    0.01       4924.83    c.m"
"             Runoff coefficient     0.686      0.000      0.686      "
"             Maximum flow           1.741      0.000      1.741      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     1.741     1.741     0.000     0.000"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   External areas"
"        5.000   % Impervious"
"        5.560   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
"        5.282   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"        0.278   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.429   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.922   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.732     1.741     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  20.098     2.762      18.336     minutes"
"             Time to Centroid       142.824    109.203    139.406    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        4758.72    250.46     5009.18    c.m"
"             Rainfall losses        51.467     7.050      49.246     mm"
"             Runoff depth           38.626     83.043     40.847     mm"
"             Runoff volume          2040.24    230.86     2271.10    c.m"
"             Runoff coefficient     0.429      0.922      0.453      "
"             Maximum flow           0.700      0.152      0.732      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.732     2.470     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.732     2.470     2.470     0.000"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
```

```
"               To Nith River"
"             Maximum flow                  2.470    c.m/sec"
"             Hydrograph volume          7195.943    c.m"
"                    0.732     2.470     2.470     2.470"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.732     0.000     2.470     2.470"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   External area draining to the site"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.686   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    1.025     0.000     2.470     2.470 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  31.792     5.339      31.792     minutes"
"             Time to Centroid       154.448    112.840    154.448    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        5504.69    0.01       5504.69    c.m"
"             Rainfall losses        28.261     5.913      28.261     mm"
"             Runoff depth           61.832     84.180     61.832     mm"
"             Runoff volume          3777.93    0.01       3777.93    c.m"
"             Runoff coefficient     0.686      0.000      0.686      "
"             Maximum flow           1.025      0.000      1.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    1.025     1.025     2.470     2.470"
" 33          CATCHMENT 102"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          102   Site (Tributary 2)"
"        0.000   % Impervious"
"       15.800   Total Area"
"      100.000   Flow length"
"        1.000   Overland Slope"
"       15.800   Pervious Area"
"      100.000   Pervious length"
"        1.000   Pervious slope"
```

```
"         0.000   Impervious Area"
"       100.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.686   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      3.192     1.025     2.470     2.470 c.m/sec"
"              Catchment 102          Pervious   Impervious Total Area "
"              Surface Area           15.800     0.000      15.800     hectare"
"              Time of concentration  24.927     4.186      24.927     minutes"
"              Time to Centroid       145.102    111.262    145.102    minutes"
"              Rainfall depth         90.093     90.093     90.093     mm"
"              Rainfall volume        1.4235     0.0000     1.4235     ha-m"
"              Rainfall losses        28.264     6.396      28.264     mm"
"              Runoff depth           61.829     83.698     61.829     mm"
"              Runoff volume          9768.94    0.01       9768.95    c.m"
"              Runoff coefficient     0.686      0.000      0.686      "
"              Maximum flow           3.192      0.000      3.192      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      3.192     4.142     2.470     2.470"
" 33           CATCHMENT 103"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           103   Site (Tributary 3)"
"         0.000   % Impervious"
"        11.060   Total Area"
"       200.000   Flow length"
"         1.000   Overland Slope"
"        11.060   Pervious Area"
"       200.000   Pervious length"
"         1.000   Pervious slope"
"         0.000   Impervious Area"
"       200.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.686   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      1.619     4.142     2.470     2.470 c.m/sec"
"              Catchment 103          Pervious   Impervious Total Area "
"              Surface Area           11.060     0.000      11.060     hectare"
"              Time of concentration  37.782     6.344      37.782     minutes"
"              Time to Centroid       162.601    114.332    162.601    minutes"
"              Rainfall depth         90.093     90.093     90.093     mm"
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"             Rainfall volume        9964.30    0.01       9964.31    c.m"
"             Rainfall losses        28.255     6.452      28.255     mm"
"             Runoff depth           61.838     83.641     61.838     mm"
"             Runoff volume          6839.31    0.01       6839.31    c.m"
"             Runoff coefficient     0.686      0.000      0.686      "
"             Maximum flow           1.619      0.000      1.619      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    1.619     5.608     2.470     2.470"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    1.619     5.608     5.608     2.470"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               To Nith River"
"             Maximum flow                  8.022    c.m/sec"
"             Hydrograph volume         27582.133    c.m"
"                    1.619     5.608     5.608     8.022"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    1.619     0.000     5.608     8.022"
" 81          ADD COMMENT================================================="
"         1  Lines of comment"
"             Flow to existing culvert on Gerber Road (east of site) "
" 33          CATCHMENT 104"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         104   Site (Tributary 4)"
"       0.000   % Impervious"
"       4.430   Total Area"
"     100.000   Flow length"
"       1.000   Overland Slope"
"       4.430   Pervious Area"
"     100.000   Pervious length"
"       1.000   Pervious slope"
"       0.000   Impervious Area"
"     100.000   Impervious length"
"       1.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      88.000   Pervious SCS Curve No."
"       0.686   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       3.464   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.000   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.895     0.000     5.608     8.022 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           4.430      0.000      4.430      hectare"
"             Time of concentration  24.927     4.186      24.927     minutes"
"             Time to Centroid       145.102    111.262    145.102    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        3991.12    0.00       3991.13    c.m"
"             Rainfall losses        28.264     6.396      28.264     mm"
"             Runoff depth           61.829     83.698     61.829     mm"
```

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"             Runoff volume          2739.01    0.00       2739.01    c.m"
"             Runoff coefficient     0.686      0.000      0.686      "
"             Maximum flow           0.895      0.000      0.895      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.895     0.895     5.608     8.022"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.895     0.895     0.895     8.022"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                To Nith River"
"             Maximum flow                  8.896    c.m/sec"
"             Hydrograph volume         30321.148    c.m"
"                    0.895     0.895     0.895     8.896"
" 38          START/RE-START TOTALS 104"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      50.930    hectare"
"             Total Impervious area                      0.278    hectare"
"             Total % impervious                         0.546"
" 19          EXIT"
```

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                   60-Design\SWM"
"                Output filename:                        4599xHazel20260522.out"
"                Licensee name:                                  Mithra Sriram"
"                Company                                   Meritech Engineering"
"                Date & Time last used:                2026-05-22 at 8:58:32 AM"
" 81           ADD COMMENT=================================================="
"          2  Lines of comment"
"             Predevelopment MIDUSS for Hurricane Hazel - 1949 Gerber "
"             Road, Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"     2880.000   Max. Storm length"
"     8000.000   Max. Hydrograph"
" 32           STORM Mass Curve"
"            3   Mass Curve"
"      285.000   Rainfall depth"
"     2880.000   Duration"
"           67   C:\M\Meritech Engineering\PRJ - DOCS\4599\60-
Design\SWM\Hazel48.mrd   Hurricane Hazel (285mm, 48 hours)"
"             Maximum intensity            53.012    mm/hr"
"             Total depth                 285.000    mm"
"            6   999hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT=================================================="
"          1  Lines of comment"
"             Flows to Ex Culvert on Greenwood Hill Drive"
" 33           CATCHMENT 101"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          101   Internal catchment (Tributary 1)"
"        0.000   % Impervious"
"        7.970   Total Area"
"      100.000   Flow length"
"        1.500   Overland Slope"
"        7.970   Pervious Area"
"      100.000   Pervious length"
"        1.500   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.879   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    1.230     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           7.970      0.000      7.970      hectare"
"             Time of concentration  34.966     6.421      34.966     minutes"
```

```
"             Time to Centroid       2435.330   2272.736   2435.329   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        2.2714     0.0000     2.2715     ha-m"
"             Rainfall losses        34.442     7.567      34.442     mm"
"             Runoff depth           250.558    277.433    250.558    mm"
"             Runoff volume          1.9969     0.0000     1.9969     ha-m"
"             Runoff coefficient     0.879      0.000      0.879      "
"             Maximum flow           1.230      0.000      1.230      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     1.230     1.230     0.000     0.000"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   External areas"
"        5.000   % Impervious"
"        5.560   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
"        5.282   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"        0.278   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.732   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.976   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.789     1.230     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  26.769     4.784      25.327     minutes"
"             Time to Centroid       2523.653   2272.189   2507.153   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1.5054     0.0792     1.5846     ha-m"
"             Rainfall losses        76.419     6.700      72.933     mm"
"             Runoff depth           208.581    278.300    212.067    mm"
"             Runoff volume          1.1017     0.0774     1.1791     ha-m"
"             Runoff coefficient     0.732      0.976      0.744      "
"             Maximum flow           0.748      0.042      0.789      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.789     2.003     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.789     2.003     2.003     0.000"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Nith River"
"             Maximum flow                  2.003    c.m/sec"
```

```
"             Hydrograph volume         31760.428    c.m"
"                     0.789     2.003     2.003     2.003"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.789     0.000     2.003     2.003"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   External area draining to the site"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.879   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.909     0.000     2.003     2.003 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  50.366     9.248      50.365     minutes"
"             Time to Centroid       2457.683   2277.995   2457.682   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1.7413     0.0000     1.7413     ha-m"
"             Rainfall losses        34.391     7.165      34.391     mm"
"             Runoff depth           250.609    277.835    250.609    mm"
"             Runoff volume          1.5312     0.0000     1.5312     ha-m"
"             Runoff coefficient     0.879      0.000      0.879      "
"             Maximum flow           0.909      0.000      0.909      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.909     0.909     2.003     2.003"
" 33          CATCHMENT 102"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          102   Site (Tributary 2)"
"        0.000   % Impervious"
"       15.800   Total Area"
"      100.000   Flow length"
"        1.000   Overland Slope"
"       15.800   Pervious Area"
"      100.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
```

```
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.879   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      2.429     0.909     2.003     2.003 c.m/sec"
"              Catchment 102          Pervious   Impervious Total Area "
"              Surface Area           15.800     0.000      15.800     hectare"
"              Time of concentration  39.489     7.251      39.489     minutes"
"              Time to Centroid       2441.990   2274.635   2441.990   minutes"
"              Rainfall depth         285.000    285.000    285.000    mm"
"              Rainfall volume        4.5030     0.0000     4.5030     ha-m"
"              Rainfall losses        34.355     7.300      34.355     mm"
"              Runoff depth           250.645    277.700    250.645    mm"
"              Runoff volume          3.9602     0.0000     3.9602     ha-m"
"              Runoff coefficient     0.879      0.000      0.879      "
"              Maximum flow           2.429      0.000      2.429      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      2.429     3.323     2.003     2.003"
" 33           CATCHMENT 103"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           103   Site (Tributary 3)"
"         0.000   % Impervious"
"        11.060   Total Area"
"       200.000   Flow length"
"         1.000   Overland Slope"
"        11.060   Pervious Area"
"       200.000   Pervious length"
"         1.000   Pervious slope"
"         0.000   Impervious Area"
"       200.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        88.000   Pervious SCS Curve No."
"         0.879   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         3.464   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      1.586     3.323     2.003     2.003 c.m/sec"
"              Catchment 103          Pervious   Impervious Total Area "
"              Surface Area           11.060     0.000      11.060     hectare"
"              Time of concentration  59.854     10.991     59.854     minutes"
"              Time to Centroid       2471.466   2281.322   2471.464   minutes"
"              Rainfall depth         285.000    285.000    285.000    mm"
"              Rainfall volume        3.1521     0.0000     3.1521     ha-m"
"              Rainfall losses        34.365     6.553      34.365     mm"
```

```
"             Runoff depth           250.635    278.447    250.635    mm"
"             Runoff volume          2.7720     0.0000     2.7720     ha-m"
"             Runoff coefficient     0.879      0.000      0.879      "
"             Maximum flow           1.586      0.000      1.586      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    1.586     4.829     2.003     2.003"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    1.586     4.829     4.829     2.003"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                To Nith River"
"             Maximum flow                  6.774    c.m/sec"
"             Hydrograph volume        114394.828    c.m"
"                    1.586     4.829     4.829     6.774"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    1.586     0.000     4.829     6.774"
" 81          ADD COMMENT================================================="
"          1  Lines of comment"
"             Flow to existing culvert on Gerber Road (east of site) "
" 33          CATCHMENT 104"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          104   Site (Tributary 4)"
"        0.000   % Impervious"
"        4.430   Total Area"
"      100.000   Flow length"
"        1.000   Overland Slope"
"        4.430   Pervious Area"
"      100.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      100.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.879   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.681     0.000     4.829     6.774 c.m/sec"
"             Catchment 104          Pervious   Impervious Total Area "
"             Surface Area           4.430      0.000      4.430      hectare"
"             Time of concentration  39.489     7.251      39.489     minutes"
"             Time to Centroid       2441.991   2274.635   2441.991   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1.2625     0.0000     1.2625     ha-m"
"             Rainfall losses        34.355     7.300      34.355     mm"
"             Runoff depth           250.645    277.700    250.645    mm"
"             Runoff volume          1.1104     0.0000     1.1104     ha-m"
"             Runoff coefficient     0.879      0.000      0.879      "
```

```
"              Maximum flow           0.681      0.000      0.681      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"              4   Add Runoff "
"                      0.681     0.681     4.829     6.774"
" 40           HYDROGRAPH Copy to Outflow"
"              8   Copy to Outflow"
"                      0.681     0.681     0.681     6.774"
" 40           HYDROGRAPH   Combine    100"
"              6   Combine "
"            100   Node #"
"                  To Nith River"
"              Maximum flow                  7.455    c.m/sec"
"              Hydrograph volume        125498.391    c.m"
"                      0.681     0.681     0.681     7.455"
" 38           START/RE-START TOTALS 104"
"              3   Runoff Totals on EXIT"
"              Total Catchment area                      50.930    hectare"
"              Total Impervious area                      0.278    hectare"
"              Total % impervious                         0.546"
" 19           EXIT"
```

Appendix D.2: Post-Development Conditions

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                                 February 7, 2010"
"           10   Units used:                                             ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                    60-Design\SWM"
"                Output filename:                          4599d5yr20260522.out"
"                Licensee name:                                   Mithra Sriram"
"                Company                                   Meritech Engineering"
"                Date & Time last used:                2026-05-22 at 9:45:07 AM"
" 81           ADD COMMENT==================================================="
"           2  Lines of comment"
"              Postdevelopment MIDUSS for 5 year storm - 1949 Gerber "
"              Road, Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32           STORM Chicago storm"
"             1   Chicago storm"
"     1593.000   Coefficient A"
"       11.000   Constant B"
"        0.879   Exponent C"
"        0.375   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"              Maximum intensity           119.727    mm/hr"
"              Total depth                  49.541    mm"
"             6   005hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT==================================================="
"           1  Lines of comment"
"              Flows to ex. culvert on Greenwood Hill Drive"
" 33           CATCHMENT 501"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           501   Uncontrolled flows from commercial block"
"        0.000   % Impervious"
"        0.500   Total Area"
"       20.000   Flow length"
"       25.000   Overland Slope"
"        0.500   Pervious Area"
"       20.000   Pervious length"
"       25.000   Pervious slope"
"        0.000   Impervious Area"
"       20.000   Impervious length"
"       25.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.254   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.032     0.000     0.000     0.000 c.m/sec"
"              Catchment 501          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.500      0.000      0.500      hectare"
"             Time of concentration  7.030      0.769      7.030      minutes"
"             Time to Centroid       133.833    109.822    133.833    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        247.70     0.00       247.70     c.m"
"             Rainfall losses        36.935     7.767      36.935     mm"
"             Runoff depth           12.606     41.773     12.606     mm"
"             Runoff volume          63.03      0.00       63.03      c.m"
"             Runoff coefficient     0.254      0.000      0.254      "
"             Maximum flow           0.032      0.000      0.032      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.032     0.032     0.000     0.000"
" 33          CATCHMENT 502"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          502   Rear yard uncontrolled flows to Greenwood Hill Road "
"       65.000   % Impervious"
"        0.250   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.088   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.162   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.256   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.879   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.050     0.032     0.000     0.000 c.m/sec"
"             Catchment 502          Pervious   Impervious Total Area "
"             Surface Area           0.088      0.162      0.250      hectare"
"             Time of concentration  12.620     1.381      2.903      minutes"
"             Time to Centroid       141.298    110.436    114.614    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        43.35      80.50      123.85     c.m"
"             Rainfall losses        36.873     5.982      16.794     mm"
"             Runoff depth           12.667     43.559     32.747     mm"
"             Runoff volume          11.08      70.78      81.87      c.m"
"             Runoff coefficient     0.256      0.879      0.661      "
"             Maximum flow           0.004      0.049      0.050      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.050     0.065     0.000     0.000"
" 33          CATCHMENT 503"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          503   Flows to Greenwood Hill Road"
"       65.000   % Impervious"
```

```
"         0.860   Total Area"
"        10.000   Flow length"
"         2.000   Overland Slope"
"         0.301   Pervious Area"
"        10.000   Pervious length"
"         2.000   Pervious slope"
"         0.559   Impervious Area"
"        10.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.255   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.869   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.170     0.065     0.000     0.000 c.m/sec"
"              Catchment 503          Pervious   Impervious Total Area "
"              Surface Area           0.301      0.559      0.860      hectare"
"              Time of concentration  9.894      1.083      2.286      minutes"
"              Time to Centroid       137.656    110.151    113.906    minutes"
"              Rainfall depth         49.541     49.541     49.541     mm"
"              Rainfall volume        149.12     276.93     426.05     c.m"
"              Rainfall losses        36.905     6.501      17.142     mm"
"              Runoff depth           12.635     43.040     32.398     mm"
"              Runoff volume          38.03      240.59     278.63     c.m"
"              Runoff coefficient     0.255      0.869      0.654      "
"              Maximum flow           0.016      0.165      0.170      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     0.170     0.233     0.000     0.000"
" 33           CATCHMENT 601"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           601   External lands to ex. culvert"
"         5.000   % Impervious"
"         5.560   Total Area"
"        50.000   Flow length"
"         1.000   Overland Slope"
"         5.282   Pervious Area"
"        50.000   Pervious length"
"         1.000   Pervious slope"
"         0.278   Impervious Area"
"        50.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.256   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.874   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
```

```
"                    0.161     0.233     0.000     0.000 c.m/sec"
"             Catchment 601          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  31.995     3.502      27.658     minutes"
"             Time to Centroid       167.506    113.828    159.336    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        2616.74    137.72     2754.47    c.m"
"             Rainfall losses        36.848     6.246      35.318     mm"
"             Runoff depth           12.692     43.295     14.222     mm"
"             Runoff volume          670.41     120.36     790.77     c.m"
"             Runoff coefficient     0.256      0.874      0.287      "
"             Maximum flow           0.148      0.081      0.161      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.161     0.327     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.161     0.327     0.327     0.000"
" 40          HYDROGRAPH   Combine    111"
"           6   Combine "
"         111   Node #"
"               To Nith River"
"             Maximum flow                  0.327    c.m/sec"
"             Hydrograph volume          1214.292    c.m"
"                    0.161     0.327     0.327     0.327"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.161     0.000     0.327     0.327"
" 81          ADD COMMENT================================================="
"           2  Lines of comment"
"              Uncontrolled drainage from rear lot area to ex. culvert on "
"              Gerber Road (east of site)"
" 33          CATCHMENT 504"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         504   Uncontrolled rear lot runoff"
"      65.000   % Impervious"
"       1.060   Total Area"
"      20.000   Flow length"
"      10.000   Overland Slope"
"       0.371   Pervious Area"
"      20.000   Pervious length"
"      10.000   Pervious slope"
"       0.689   Impervious Area"
"      20.000   Impervious length"
"      10.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      74.000   Pervious SCS Curve No."
"       0.255   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       8.924   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.864   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.209     0.000     0.327     0.327 c.m/sec"
"             Catchment 504          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.371      0.689      1.060      hectare"
"             Time of concentration  9.254      1.013      2.144      minutes"
"             Time to Centroid       136.734    110.058    113.720    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        183.80     341.34     525.13     c.m"
"             Rainfall losses        36.886     6.715      17.275     mm"
"             Runoff depth           12.655     42.825     32.266     mm"
"             Runoff volume          46.95      295.07     342.02     c.m"
"             Runoff coefficient     0.255      0.864      0.651      "
"             Maximum flow           0.021      0.202      0.209      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.209     0.209     0.327     0.327"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.209     0.209     0.209     0.327"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  0.537    c.m/sec"
"             Hydrograph volume          1556.309    c.m"
"                     0.209     0.209     0.209     0.537"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.209     0.000     0.209     0.537"
" 81          ADD COMMENT================================================="
"           1  Lines of comment"
"              Flows to the on-site SWM facility"
" 33          CATCHMENT 701"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          701   Commercial Block"
"       75.000   % Impervious"
"        2.550   Total Area"
"       20.000   Flow length"
"        1.000   Overland Slope"
"        0.638   Pervious Area"
"       20.000   Pervious length"
"        1.000   Pervious slope"
"        1.912   Impervious Area"
"       20.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.256   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.884   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.576     0.000     0.209     0.537 c.m/sec"
"             Catchment 701          Pervious   Impervious Total Area "
"             Surface Area           0.638      1.912      2.550      hectare"
"             Time of concentration  18.464     2.021      3.469      minutes"
"             Time to Centroid       149.178    111.386    114.715    minutes"
```

```
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        315.82     947.47     1263.29    c.m"
"             Rainfall losses        36.858     5.770      13.542     mm"
"             Runoff depth           12.683     43.770     35.998     mm"
"             Runoff volume          80.85      837.11     917.96     c.m"
"             Runoff coefficient     0.256      0.884      0.727      "
"             Maximum flow           0.025      0.572      0.576      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.576     0.576     0.209     0.537"
" 33          CATCHMENT 602"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          602   External Lands to SWM facility"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.531   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.306     0.576     0.209     0.537 c.m/sec"
"             Catchment 602          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  44.400     6.770      44.400     minutes"
"             Time to Centroid       179.510    118.516    179.510    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        3026.94    0.00       3026.94    c.m"
"             Rainfall losses        23.249     5.653      23.249     mm"
"             Runoff depth           26.291     43.888     26.291     mm"
"             Runoff volume          1606.41    0.00       1606.41    c.m"
"             Runoff coefficient     0.531      0.000      0.531      "
"             Maximum flow           0.306      0.000      0.306      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.306     0.607     0.209     0.537"
" 33          CATCHMENT 702"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          702   Subdivision lands"
"       65.000   % Impervious"
"       31.140   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
```

```
"       10.899   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"       20.241   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.256   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.874   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    5.921     0.607     0.209     0.537 c.m/sec"
"             Catchment 702          Pervious   Impervious Total Area "
"             Surface Area           10.899     20.241     31.140     hectare"
"             Time of concentration  31.995     3.502      7.387      minutes"
"             Time to Centroid       167.506    113.828    121.146    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        0.5399     1.0028     1.5427     ha-m"
"             Rainfall losses        36.848     6.246      16.957     mm"
"             Runoff depth           12.692     43.295     32.584     mm"
"             Runoff volume          0.1383     0.8763     1.0147     ha-m"
"             Runoff coefficient     0.256      0.874      0.658      "
"             Maximum flow           0.306      5.893      5.921      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    5.921     6.527     0.209     0.537"
" 33          CATCHMENT 703"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          703   SWM block "
"       85.000   % Impervious"
"        2.900   Total Area"
"        5.000   Flow length"
"        1.000   Overland Slope"
"        0.435   Pervious Area"
"        5.000   Pervious length"
"        1.000   Pervious slope"
"        2.465   Impervious Area"
"        5.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.255   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.854   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.721     6.527     0.209     0.537 c.m/sec"
"             Catchment 703          Pervious   Impervious Total Area "
"             Surface Area           0.435      2.465      2.900      hectare"
```

```
"             Time of concentration  8.037      0.880      1.239      minutes"
"             Time to Centroid       135.133    109.879    111.145    minutes"
"             Rainfall depth         49.541     49.541     49.541     mm"
"             Rainfall volume        215.50     1221.18    1436.68    c.m"
"             Rainfall losses        36.885     7.227      11.676     mm"
"             Runoff depth           12.656     42.314     37.865     mm"
"             Runoff volume          55.05      1043.04    1098.09    c.m"
"             Runoff coefficient     0.255      0.854      0.764      "
"             Maximum flow           0.027      0.713      0.721      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.721     7.248     0.209     0.537"
" 54          POND DESIGN"
"        7.248   Current peak flow    c.m/sec"
"        3.500   Target outflow    c.m/sec"
"      13769.2   Hydrograph volume    c.m"
"           8.   Number of stages"
"      356.700   Minimum water level    metre"
"      359.100   Maximum water level    metre"
"      356.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                356.700     0.000     0.000"
"                357.000   0.05305  2191.462"
"                357.300    0.1823  4539.618"
"                357.600    0.3245  7050.131"
"                358.000    0.7480  10658.73"
"                358.400     1.157  14577.91"
"                358.650     1.565  17190.84"
"                359.100     5.675  22222.57"
"           1.   WEIRS"
"                  Crest      Weir     Crest      Left     Right"
"              elevation coefficie   breadth sideslope sideslope"
"                358.650     0.900     7.500     1.000     1.000"
"           3.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                356.700     0.630    0.3750     1.000"
"                357.300     0.630    0.6000     1.000"
"                358.000     0.630    0.6000     1.000"
"           1.   LAYERS"
"                 Bottom    Aspect    Bottom       Top   Average"
"                   area     ratio elevation elevation sideslope"
"               7050.000     1.100   356.700   359.100     5.000"
"             Peak outflow                  0.609    c.m/sec"
"             Maximum level               357.869    metre"
"             Maximum storage            9478.550    c.m"
"             Centroidal lag                8.650   hours"
"                  0.721     7.248     0.609     0.537 c.m/sec"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  0.735    c.m/sec"
"             Hydrograph volume         14447.393    c.m"
"                     0.721     7.248     0.609     0.735"
" 38          START/RE-START TOTALS 703"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     50.930    hectare"
```

```
"             Total Impervious area                    26.307    hectare"
"             Total % impervious                       51.653"
" 19          EXIT"
```

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                   60-Design\SWM"
"                Output filename:                         4599d25mm20260522.out"
"                Licensee name:                                  Mithra Sriram"
"                Company                                  Meritech Engineering"
"                Date & Time last used:                2026-05-22 at 9:48:10 AM"
" 81           ADD COMMENT==================================================="
"            2  Lines of comment"
"               Postdevelopment MIDUSS for 25mm storm - 1949 Gerber "
"               Road, Wellesley "
" 31           TIME PARAMETERS"
"         5.000   Time Step"
"       240.000   Max. Storm length"
"      1500.000   Max. Hydrograph"
" 32           STORM Chicago storm"
"              1   Chicago storm"
"       509.000   Coefficient A"
"         6.000   Constant B"
"         0.799   Exponent C"
"         0.375   Fraction R"
"       240.000   Duration"
"         1.000   Time step multiplier"
"               Maximum intensity            61.796    mm/hr"
"               Total depth                  25.028    mm"
"              6   999hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT==================================================="
"            1  Lines of comment"
"               Flows to ex. culvert on Greenwood Hill Drive"
" 33           CATCHMENT 501"
"              1   Triangular SCS"
"              1   Equal length"
"              1   SCS method"
"            501   Uncontrolled flows from commercial block"
"         0.000   % Impervious"
"         0.500   Total Area"
"        20.000   Flow length"
"        25.000   Overland Slope"
"         0.500   Pervious Area"
"        20.000   Pervious length"
"        25.000   Pervious slope"
"         0.000   Impervious Area"
"        20.000   Impervious length"
"        25.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.098   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.000   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.003     0.000     0.000     0.000 c.m/sec"
"               Catchment 501          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.500      0.000      0.500      hectare"
"             Time of concentration  16.054     1.031      16.054     minutes"
"             Time to Centroid       158.565    114.733    158.564    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        125.14     0.00       125.14     c.m"
"             Rainfall losses        22.571     5.476      22.571     mm"
"             Runoff depth           2.456      19.551     2.456      mm"
"             Runoff volume          12.28      0.00       12.28      c.m"
"             Runoff coefficient     0.098      0.000      0.098      "
"             Maximum flow           0.003      0.000      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.003     0.003     0.000     0.000"
" 33          CATCHMENT 502"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          502   Rear yard uncontrolled flows to Greenwood Hill Road "
"       65.000   % Impervious"
"        0.250   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.088   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.162   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.098   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.798   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.023     0.003     0.000     0.000 c.m/sec"
"             Catchment 502          Pervious   Impervious Total Area "
"             Surface Area           0.088      0.162      0.250      hectare"
"             Time of concentration  28.821     1.850      3.528      minutes"
"             Time to Centroid       173.928    115.968    119.573    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        21.90      40.67      62.57      c.m"
"             Rainfall losses        22.568     5.063      11.190     mm"
"             Runoff depth           2.459      19.965     13.838     mm"
"             Runoff volume          2.15       32.44      34.59      c.m"
"             Runoff coefficient     0.098      0.798      0.553      "
"             Maximum flow           0.000      0.023      0.023      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.023     0.023     0.000     0.000"
" 33          CATCHMENT 503"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          503   Flows to Greenwood Hill Road"
"       65.000   % Impervious"
```

```
"         0.860   Total Area"
"        10.000   Flow length"
"         2.000   Overland Slope"
"         0.301   Pervious Area"
"        10.000   Pervious length"
"         2.000   Pervious slope"
"         0.559   Impervious Area"
"        10.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.098   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.795   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.080     0.023     0.000     0.000 c.m/sec"
"              Catchment 503          Pervious   Impervious Total Area "
"              Surface Area           0.301      0.559      0.860      hectare"
"              Time of concentration  22.597     1.451      2.770      minutes"
"              Time to Centroid       166.427    115.396    118.580    minutes"
"              Rainfall depth         25.028     25.028     25.028     mm"
"              Rainfall volume        75.33      139.90     215.24     c.m"
"              Rainfall losses        22.569     5.129      11.233     mm"
"              Runoff depth           2.459      19.898     13.795     mm"
"              Runoff volume          7.40       111.23     118.63     c.m"
"              Runoff coefficient     0.098      0.795      0.551      "
"              Maximum flow           0.002      0.080      0.080      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      0.080     0.103     0.000     0.000"
" 33           CATCHMENT 601"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           601   External lands to ex. culvert"
"         5.000   % Impervious"
"         5.560   Total Area"
"        50.000   Flow length"
"         1.000   Overland Slope"
"         5.282   Pervious Area"
"        50.000   Pervious length"
"         1.000   Pervious slope"
"         0.278   Impervious Area"
"        50.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.098   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.803   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
```

```
"                    0.034     0.103     0.000     0.000 c.m/sec"
"             Catchment 601          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  73.070     4.691      52.511     minutes"
"             Time to Centroid       227.306    120.387    195.159    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1321.96    69.58      1391.54    c.m"
"             Rainfall losses        22.566     4.922      21.684     mm"
"             Runoff depth           2.461      20.106     3.344      mm"
"             Runoff volume          130.01     55.89      185.90     c.m"
"             Runoff coefficient     0.098      0.803      0.134      "
"             Maximum flow           0.013      0.034      0.034      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.034     0.137     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.034     0.137     0.137     0.000"
" 40          HYDROGRAPH   Combine    111"
"           6   Combine "
"         111   Node #"
"               To Nith River"
"             Maximum flow                  0.137    c.m/sec"
"             Hydrograph volume           351.410    c.m"
"                    0.034     0.137     0.137     0.137"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.034     0.000     0.137     0.137"
" 81          ADD COMMENT================================================="
"         2  Lines of comment"
"            Uncontrolled drainage from rear lot area to ex. culvert on "
"            Gerber Road (east of site)"
" 33          CATCHMENT 504"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         504   Uncontrolled rear lot runoff"
"      65.000   % Impervious"
"       1.060   Total Area"
"      20.000   Flow length"
"      10.000   Overland Slope"
"       0.371   Pervious Area"
"      20.000   Pervious length"
"      10.000   Pervious slope"
"       0.689   Impervious Area"
"      20.000   Impervious length"
"      10.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      74.000   Pervious SCS Curve No."
"       0.098   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       8.924   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.794   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.098     0.000     0.137     0.137 c.m/sec"
"             Catchment 504          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.371      0.689      1.060      hectare"
"             Time of concentration  21.134     1.357      2.593      minutes"
"             Time to Centroid       164.651    115.296    118.381    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        92.85      172.44     265.29     c.m"
"             Rainfall losses        22.569     5.168      11.258     mm"
"             Runoff depth           2.459      19.860     13.770     mm"
"             Runoff volume          9.12       136.84     145.96     c.m"
"             Runoff coefficient     0.098      0.794      0.550      "
"             Maximum flow           0.002      0.098      0.098      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.098     0.098     0.137     0.137"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.098     0.098     0.098     0.137"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  0.235    c.m/sec"
"             Hydrograph volume           497.369    c.m"
"                     0.098     0.098     0.098     0.235"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.098     0.000     0.098     0.235"
" 81          ADD COMMENT================================================="
"           1  Lines of comment"
"              Flows to the on-site SWM facility"
" 33          CATCHMENT 701"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          701   Commercial Block"
"       75.000   % Impervious"
"        2.550   Total Area"
"       20.000   Flow length"
"        1.000   Overland Slope"
"        0.638   Pervious Area"
"       20.000   Pervious length"
"        1.000   Pervious slope"
"        1.912   Impervious Area"
"       20.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.098   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.795   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.266     0.000     0.098     0.235 c.m/sec"
"             Catchment 701          Pervious   Impervious Total Area "
"             Surface Area           0.638      1.912      2.550      hectare"
"             Time of concentration  42.167     2.707      4.270      minutes"
"             Time to Centroid       190.021    117.440    120.314    minutes"
```

```
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        159.55     478.65     638.21     c.m"
"             Rainfall losses        22.567     5.128      9.488      mm"
"             Runoff depth           2.461      19.899     15.540     mm"
"             Runoff volume          15.69      380.57     396.26     c.m"
"             Runoff coefficient     0.098      0.795      0.621      "
"             Maximum flow           0.002      0.266      0.266      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.266     0.266     0.098     0.235"
" 33          CATCHMENT 602"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          602   External Lands to SWM facility"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.331   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.056     0.266     0.098     0.235 c.m/sec"
"             Catchment 602          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  71.352     9.069      71.352     minutes"
"             Time to Centroid       227.443    126.943    227.443    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        1529.19    0.00       1529.19    c.m"
"             Rainfall losses        16.754     4.883      16.754     mm"
"             Runoff depth           8.273      20.144     8.273      mm"
"             Runoff volume          505.50     0.00       505.50     c.m"
"             Runoff coefficient     0.331      0.000      0.331      "
"             Maximum flow           0.056      0.000      0.056      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.056     0.269     0.098     0.235"
" 33          CATCHMENT 702"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          702   Subdivision lands"
"       65.000   % Impervious"
"       31.140   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
```

```
"       10.899   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"       20.241   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.098   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.803   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    2.480     0.269     0.098     0.235 c.m/sec"
"             Catchment 702          Pervious   Impervious Total Area "
"             Surface Area           10.899     20.241     31.140     hectare"
"             Time of concentration  73.070     4.691      8.920      minutes"
"             Time to Centroid       227.306    120.387    126.999    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        2727.77    5065.85    7793.62    c.m"
"             Rainfall losses        22.566     4.922      11.098     mm"
"             Runoff depth           2.461      20.106     13.930     mm"
"             Runoff volume          268.26     4069.57    4337.83    c.m"
"             Runoff coefficient     0.098      0.803      0.557      "
"             Maximum flow           0.027      2.480      2.480      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    2.480     2.749     0.098     0.235"
" 33          CATCHMENT 703"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          703   SWM block "
"       85.000   % Impervious"
"        2.900   Total Area"
"        5.000   Flow length"
"        1.000   Overland Slope"
"        0.435   Pervious Area"
"        5.000   Pervious length"
"        1.000   Pervious slope"
"        2.465   Impervious Area"
"        5.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.098   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.788   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.349     2.749     0.098     0.235 c.m/sec"
"             Catchment 703          Pervious   Impervious Total Area "
"             Surface Area           0.435      2.465      2.900      hectare"
```

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"             Time of concentration  18.354     1.178      1.548      minutes"
"             Time to Centroid       161.304    115.024    116.020    minutes"
"             Rainfall depth         25.028     25.028     25.028     mm"
"             Rainfall volume        108.87     616.93     725.80     c.m"
"             Rainfall losses        22.570     5.305      7.894      mm"
"             Runoff depth           2.458      19.723     17.133     mm"
"             Runoff volume          10.69      486.18     496.87     c.m"
"             Runoff coefficient     0.098      0.788      0.685      "
"             Maximum flow           0.002      0.349      0.349      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.349     3.098     0.098     0.235"
" 54          POND DESIGN"
"        3.098   Current peak flow    c.m/sec"
"        3.500   Target outflow    c.m/sec"
"       5736.5   Hydrograph volume    c.m"
"           8.   Number of stages"
"      356.700   Minimum water level    metre"
"      359.100   Maximum water level    metre"
"      356.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                356.700     0.000     0.000"
"                357.000   0.05305  2191.462"
"                357.300    0.1823  4539.618"
"                357.600    0.3245  7050.131"
"                358.000    0.7480  10658.73"
"                358.400     1.157  14577.91"
"                358.650     1.565  17190.84"
"                359.100     5.675  22222.57"
"           1.   WEIRS"
"                  Crest      Weir     Crest      Left     Right"
"              elevation coefficie   breadth sideslope sideslope"
"                358.650     0.900     7.500     1.000     1.000"
"           3.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                356.700     0.630    0.3750     1.000"
"                357.300     0.630    0.6000     1.000"
"                358.000     0.630    0.6000     1.000"
"           1.   LAYERS"
"                 Bottom    Aspect    Bottom       Top   Average"
"                   area     ratio elevation elevation sideslope"
"               7050.000     1.100   356.700   359.100     5.000"
"             Peak outflow                  0.161    c.m/sec"
"             Maximum level                357.251    metre"
"             Maximum storage             4154.499    c.m"
"             Centroidal lag                11.216   hours"
"                  0.349     3.098     0.161     0.235 c.m/sec"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  0.264    c.m/sec"
"             Hydrograph volume          5624.267    c.m"
"                     0.349     3.098     0.161     0.264"
" 38          START/RE-START TOTALS 703"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     50.930    hectare"
```

```
"             Total Impervious area                    26.307    hectare"
"             Total % impervious                       51.653"
" 19          EXIT"
```

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                   60-Design\SWM"
"                Output filename:                        4599d100yr20260522.out"
"                Licensee name:                                  Mithra Sriram"
"                Company                                   Meritech Engineering"
"                Date & Time last used:                2026-05-22 at 9:22:48 AM"
" 81           ADD COMMENT==================================================="
"          2  Lines of comment"
"             Postdevelopment MIDUSS for 100 year storm - 1949 Gerber "
"             Road, Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"      240.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32           STORM Chicago storm"
"            1   Chicago storm"
"     4688.000   Coefficient A"
"       17.000   Constant B"
"        0.962   Exponent C"
"        0.375   Fraction R"
"      240.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          211.919    mm/hr"
"             Total depth                 90.093    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT==================================================="
"          1  Lines of comment"
"             Flows to ex. culvert on Greenwood Hill Drive"
" 33           CATCHMENT 501"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          501   Uncontrolled flows from commercial block"
"        0.000   % Impervious"
"        0.500   Total Area"
"       20.000   Flow length"
"       25.000   Overland Slope"
"        0.500   Pervious Area"
"       20.000   Pervious length"
"       25.000   Pervious slope"
"        0.000   Impervious Area"
"       20.000   Impervious length"
"       25.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.426   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.117     0.000     0.000     0.000 c.m/sec"
"             Catchment 501          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.500      0.000      0.500      hectare"
"             Time of concentration  4.416      0.607      4.416      minutes"
"             Time to Centroid       121.983    106.546    121.983    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        450.47     0.00       450.47     c.m"
"             Rainfall losses        51.727     12.809     51.727     mm"
"             Runoff depth           38.366     77.285     38.366     mm"
"             Runoff volume          191.83     0.00       191.83     c.m"
"             Runoff coefficient     0.426      0.000      0.426      "
"             Maximum flow           0.117      0.000      0.117      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.117     0.117     0.000     0.000"
" 33          CATCHMENT 502"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          502   Rear yard uncontrolled flows to Greenwood Hill Road "
"       65.000   % Impervious"
"        0.250   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.088   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.162   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.427   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.913   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.096     0.117     0.000     0.000 c.m/sec"
"             Catchment 502          Pervious   Impervious Total Area "
"             Surface Area           0.088      0.162      0.250      hectare"
"             Time of concentration  7.927      1.089      2.466      minutes"
"             Time to Centroid       126.669    106.872    110.857    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        78.83      146.40     225.23     c.m"
"             Rainfall losses        51.604     7.861      23.171     mm"
"             Runoff depth           38.489     82.232     66.922     mm"
"             Runoff volume          33.68      133.63     167.31     c.m"
"             Runoff coefficient     0.427      0.913      0.743      "
"             Maximum flow           0.019      0.087      0.096      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.096     0.191     0.000     0.000"
" 33          CATCHMENT 503"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          503   Flows to Greenwood Hill Road"
"       65.000   % Impervious"
```

```
"         0.860   Total Area"
"        10.000   Flow length"
"         2.000   Overland Slope"
"         0.301   Pervious Area"
"        10.000   Pervious length"
"         2.000   Pervious slope"
"         0.559   Impervious Area"
"        10.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.426   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.894   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.336     0.191     0.000     0.000 c.m/sec"
"              Catchment 503          Pervious   Impervious Total Area "
"              Surface Area           0.301      0.559      0.860      hectare"
"              Time of concentration  6.215      0.854      1.949      minutes"
"              Time to Centroid       124.436    106.663    110.293    minutes"
"              Rainfall depth         90.093     90.093     90.093     mm"
"              Rainfall volume        271.18     503.62     774.80     c.m"
"              Rainfall losses        51.710     9.572      24.320     mm"
"              Runoff depth           38.383     80.521     65.773     mm"
"              Runoff volume          115.53     450.11     565.65     c.m"
"              Runoff coefficient     0.426      0.894      0.730      "
"              Maximum flow           0.067      0.292      0.336      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      0.336     0.524     0.000     0.000"
" 33           CATCHMENT 601"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           601   External lands to ex. culvert"
"         5.000   % Impervious"
"         5.560   Total Area"
"        50.000   Flow length"
"         1.000   Overland Slope"
"         5.282   Pervious Area"
"        50.000   Pervious length"
"         1.000   Pervious slope"
"         0.278   Impervious Area"
"        50.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.429   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.922   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
```

```
"                    0.732     0.524     0.000     0.000 c.m/sec"
"             Catchment 601          Pervious   Impervious Total Area "
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  20.098     2.762      18.336     minutes"
"             Time to Centroid       142.824    109.203    139.406    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        4758.72    250.46     5009.18    c.m"
"             Rainfall losses        51.467     7.050      49.246     mm"
"             Runoff depth           38.626     83.043     40.847     mm"
"             Runoff volume          2040.25    230.86     2271.11    c.m"
"             Runoff coefficient     0.429      0.922      0.453      "
"             Maximum flow           0.700      0.152      0.732      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.732     0.958     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.732     0.958     0.958     0.000"
" 40          HYDROGRAPH   Combine    111"
"           6   Combine "
"         111   Node #"
"               To Nith River"
"             Maximum flow                  0.958    c.m/sec"
"             Hydrograph volume          3195.884    c.m"
"                    0.732     0.958     0.958     0.958"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.732     0.000     0.958     0.958"
" 81          ADD COMMENT================================================="
"         2  Lines of comment"
"            Uncontrolled drainage from rear lot area to ex. culvert on "
"            Gerber Road (east of site)"
" 33          CATCHMENT 504"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         504   Uncontrolled rear lot runoff"
"      65.000   % Impervious"
"       1.060   Total Area"
"      20.000   Flow length"
"      10.000   Overland Slope"
"       0.371   Pervious Area"
"      20.000   Pervious length"
"      10.000   Pervious slope"
"       0.689   Impervious Area"
"      20.000   Impervious length"
"      10.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      74.000   Pervious SCS Curve No."
"       0.426   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       8.924   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.887   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.414     0.000     0.958     0.958 c.m/sec"
"             Catchment 504          Pervious   Impervious Total Area "
```

```
"             Surface Area           0.371      0.689      1.060      hectare"
"             Time of concentration  5.813      0.799      1.828      minutes"
"             Time to Centroid       123.912    106.609    110.162    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        334.25     620.74     954.99     c.m"
"             Rainfall losses        51.725     10.148     24.700     mm"
"             Runoff depth           38.369     79.945     65.393     mm"
"             Runoff volume          142.35     550.82     693.17     c.m"
"             Runoff coefficient     0.426      0.887      0.726      "
"             Maximum flow           0.084      0.357      0.414      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.414     0.414     0.958     0.958"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.414     0.414     0.414     0.958"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  1.228    c.m/sec"
"             Hydrograph volume          3889.052    c.m"
"                     0.414     0.414     0.414     1.228"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.414     0.000     0.414     1.228"
" 81          ADD COMMENT================================================="
"           1  Lines of comment"
"              Flows to the on-site SWM facility"
" 33          CATCHMENT 701"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          701   Commercial Block"
"       75.000   % Impervious"
"        2.550   Total Area"
"       20.000   Flow length"
"        1.000   Overland Slope"
"        0.638   Pervious Area"
"       20.000   Pervious length"
"        1.000   Pervious slope"
"        1.912   Impervious Area"
"       20.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.428   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.928   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     1.094     0.000     0.414     1.228 c.m/sec"
"             Catchment 701          Pervious   Impervious Total Area "
"             Surface Area           0.638      1.912      2.550      hectare"
"             Time of concentration  11.598     1.594      2.928      minutes"
"             Time to Centroid       131.492    107.460    110.665    minutes"
```

```
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        574.34     1723.03    2297.38    c.m"
"             Rainfall losses        51.506     6.515      17.763     mm"
"             Runoff depth           38.587     83.578     72.330     mm"
"             Runoff volume          245.99     1598.43    1844.43    c.m"
"             Runoff coefficient     0.428      0.928      0.803      "
"             Maximum flow           0.113      1.055      1.094      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     1.094     1.094     0.414     1.228"
" 33          CATCHMENT 602"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          602   External Lands to SWM facility"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.686   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     1.025     1.094     0.414     1.228 c.m/sec"
"             Catchment 602          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  31.792     5.339      31.792     minutes"
"             Time to Centroid       154.448    112.840    154.448    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        5504.69    0.01       5504.69    c.m"
"             Rainfall losses        28.261     5.913      28.261     mm"
"             Runoff depth           61.832     84.180     61.832     mm"
"             Runoff volume          3777.93    0.01       3777.93    c.m"
"             Runoff coefficient     0.686      0.000      0.686      "
"             Maximum flow           1.025      0.000      1.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     1.025     1.313     0.414     1.228"
" 33          CATCHMENT 702"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          702   Subdivision lands"
"       65.000   % Impervious"
"       31.140   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
```

```
"       10.899   Pervious Area"
"       50.000   Pervious length"
"        1.000   Pervious slope"
"       20.241   Impervious Area"
"       50.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.429   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.922   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    11.377     1.313     0.414     1.228 c.m/sec"
"             Catchment 702          Pervious   Impervious Total Area "
"             Surface Area           10.899     20.241     31.140     hectare"
"             Time of concentration  20.098     2.762      6.234      minutes"
"             Time to Centroid       142.824    109.203    115.937    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        0.9819     1.8236     2.8055     ha-m"
"             Rainfall losses        51.467     7.050      22.596     mm"
"             Runoff depth           38.626     83.043     67.497     mm"
"             Runoff volume          0.4210     1.6809     2.1019     ha-m"
"             Runoff coefficient     0.429      0.922      0.749      "
"             Maximum flow           1.445      11.092     11.377     c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    11.377    12.639     0.414     1.228"
" 33          CATCHMENT 703"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          703   SWM block "
"       85.000   % Impervious"
"        2.900   Total Area"
"        5.000   Flow length"
"        1.000   Overland Slope"
"        0.435   Pervious Area"
"        5.000   Pervious length"
"        1.000   Pervious slope"
"        2.465   Impervious Area"
"        5.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.426   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.873   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    1.327    12.639     0.414     1.228 c.m/sec"
"             Catchment 703          Pervious   Impervious Total Area "
"             Surface Area           0.435      2.465      2.900      hectare"
```

```
"             Time of concentration  5.048      0.694      1.039      minutes"
"             Time to Centroid       122.864    106.534    107.828    minutes"
"             Rainfall depth         90.093     90.093     90.093     mm"
"             Rainfall volume        391.91     2220.80    2612.70    c.m"
"             Rainfall losses        51.749     11.468     17.510     mm"
"             Runoff depth           38.344     78.626     72.583     mm"
"             Runoff volume          166.80     1938.12    2104.91    c.m"
"             Runoff coefficient     0.426      0.873      0.806      "
"             Maximum flow           0.101      1.253      1.327      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     1.327    13.966     0.414     1.228"
" 54          POND DESIGN"
"       13.966   Current peak flow    c.m/sec"
"        3.500   Target outflow    c.m/sec"
"      28745.9   Hydrograph volume    c.m"
"           8.   Number of stages"
"      356.700   Minimum water level    metre"
"      359.100   Maximum water level    metre"
"      356.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                356.700     0.000     0.000"
"                357.000   0.05305  2191.462"
"                357.300    0.1823  4539.618"
"                357.600    0.3245  7050.131"
"                358.000    0.7480  10658.73"
"                358.400     1.157  14577.91"
"                358.650     1.565  17190.84"
"                359.100     5.675  22222.57"
"           1.   WEIRS"
"                  Crest      Weir     Crest      Left     Right"
"              elevation coefficie   breadth sideslope sideslope"
"                358.650     0.900     7.500     1.000     1.000"
"           3.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                356.700     0.630    0.3750     1.000"
"                357.300     0.630    0.6000     1.000"
"                358.000     0.630    0.6000     1.000"
"           1.   LAYERS"
"                 Bottom    Aspect    Bottom       Top   Average"
"                   area     ratio elevation elevation sideslope"
"               7050.000     1.100   356.700   359.100     5.000"
"             Peak outflow                  2.597    c.m/sec"
"             Maximum level               358.763    metre"
"             Maximum storage           18454.512    c.m"
"             Centroidal lag                6.496   hours"
"                  1.327    13.966     2.597     1.228 c.m/sec"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  3.059    c.m/sec"
"             Hydrograph volume         31606.602    c.m"
"                     1.327    13.966     2.597     3.059"
" 38          START/RE-START TOTALS 703"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                     50.930    hectare"
```

```
"             Total Impervious area                    26.307    hectare"
"             Total % impervious                       51.653"
" 19          EXIT"
```

```
"                MIDUSS Output ------------------------------------------------>"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                               February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:         C:\M\Meritech Engineering\PRJ - DOCS\4599\"
"                                                                   60-Design\SWM"
"                Output filename:                        4599dHazel20260522.out"
"                Licensee name:                                  Mithra Sriram"
"                Company                                   Meritech Engineering"
"                Date & Time last used:                2026-05-22 at 9:03:31 AM"
" 81           ADD COMMENT==================================================="
"          2  Lines of comment"
"             Postdevelopment MIDUSS for Hurricane Hazel - 1949 Gerber "
"             Road, Wellesley "
" 31           TIME PARAMETERS"
"        5.000   Time Step"
"     2880.000   Max. Storm length"
"     8000.000   Max. Hydrograph"
" 32           STORM Mass Curve"
"            3   Mass Curve"
"      285.000   Rainfall depth"
"     2880.000   Duration"
"           67   C:\M\Meritech Engineering\PRJ - DOCS\4599\60-
Design\SWM\Hazel48.mrd   Hurricane Hazel (285mm, 48 hours)"
"             Maximum intensity            53.012    mm/hr"
"             Total depth                 285.000    mm"
"            6   999hyd   Hydrograph extension used in this file"
" 81           ADD COMMENT==================================================="
"          1  Lines of comment"
"             Flows to ex. culvert on Greenwood Hill Drive"
" 33           CATCHMENT 501"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          501   Uncontrolled flows from commercial block"
"        0.000   % Impervious"
"        0.500   Total Area"
"       20.000   Flow length"
"       25.000   Overland Slope"
"        0.500   Pervious Area"
"       20.000   Pervious length"
"       25.000   Pervious slope"
"        0.000   Impervious Area"
"       20.000   Impervious length"
"       25.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.725   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.068     0.000     0.000     0.000 c.m/sec"
"             Catchment 501          Pervious   Impervious Total Area "
"             Surface Area           0.500      0.000      0.500      hectare"
"             Time of concentration  5.882      1.051      5.882      minutes"
```

```
"             Time to Centroid       2492.185   2267.839   2492.186   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1425.00    0.00       1425.00    c.m"
"             Rainfall losses        78.461     14.125     78.461     mm"
"             Runoff depth           206.539    270.875    206.539    mm"
"             Runoff volume          1032.70    0.00       1032.70    c.m"
"             Runoff coefficient     0.725      0.000      0.725      "
"             Maximum flow           0.068      0.000      0.068      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.068     0.068     0.000     0.000"
" 33          CATCHMENT 502"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          502   Rear yard uncontrolled flows to Greenwood Hill Road "
"       65.000   % Impervious"
"        0.250   Total Area"
"       15.000   Flow length"
"        2.000   Overland Slope"
"        0.088   Pervious Area"
"       15.000   Pervious length"
"        2.000   Pervious slope"
"        0.162   Impervious Area"
"       15.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.730   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.963   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.036     0.068     0.000     0.000 c.m/sec"
"             Catchment 502          Pervious   Impervious Total Area "
"             Surface Area           0.088      0.162      0.250      hectare"
"             Time of concentration  10.558     1.887      4.402      minutes"
"             Time to Centroid       2500.415   2269.667   2336.580   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        249.38     463.12     712.50     c.m"
"             Rainfall losses        76.931     10.684     33.870     mm"
"             Runoff depth           208.069    274.316    251.130    mm"
"             Runoff volume          182.06     445.76     627.82     c.m"
"             Runoff coefficient     0.730      0.963      0.881      "
"             Maximum flow           0.012      0.024      0.036      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.036     0.103     0.000     0.000"
" 33          CATCHMENT 503"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          503   Flows to Greenwood Hill Road"
"       65.000   % Impervious"
"        0.860   Total Area"
"       10.000   Flow length"
```

```
"         2.000   Overland Slope"
"         0.301   Pervious Area"
"        10.000   Pervious length"
"         2.000   Pervious slope"
"         0.559   Impervious Area"
"        10.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.730   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.970   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.122     0.103     0.000     0.000 c.m/sec"
"              Catchment 503          Pervious   Impervious Total Area "
"              Surface Area           0.301      0.559      0.860      hectare"
"              Time of concentration  8.278      1.479      3.440      minutes"
"              Time to Centroid       2497.307   2266.252   2332.868   minutes"
"              Rainfall depth         285.000    285.000    285.000    mm"
"              Rainfall volume        857.85     1593.15    2451.00    c.m"
"              Rainfall losses        76.932     8.442      32.414     mm"
"              Runoff depth           208.068    276.558    252.586    mm"
"              Runoff volume          626.28     1545.96    2172.24    c.m"
"              Runoff coefficient     0.730      0.970      0.886      "
"              Maximum flow           0.041      0.081      0.122      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                      0.122     0.224     0.000     0.000"
" 33           CATCHMENT 601"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           601   External lands to ex. culvert"
"         5.000   % Impervious"
"         5.560   Total Area"
"        50.000   Flow length"
"         1.000   Overland Slope"
"         5.282   Pervious Area"
"        50.000   Pervious length"
"         1.000   Pervious slope"
"         0.278   Impervious Area"
"        50.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.732   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.976   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                      0.789     0.224     0.000     0.000 c.m/sec"
"              Catchment 601          Pervious   Impervious Total Area "
```

```
"             Surface Area           5.282      0.278      5.560      hectare"
"             Time of concentration  26.769     4.784      25.327     minutes"
"             Time to Centroid       2523.653   2272.189   2507.153   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1.5054     0.0792     1.5846     ha-m"
"             Rainfall losses        76.419     6.700      72.933     mm"
"             Runoff depth           208.581    278.300    212.067    mm"
"             Runoff volume          1.1017     0.0774     1.1791     ha-m"
"             Runoff coefficient     0.732      0.976      0.744      "
"             Maximum flow           0.748      0.042      0.789      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.789     1.012     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.789     1.012     1.012     0.000"
" 40          HYDROGRAPH   Combine    111"
"           6   Combine "
"         111   Node #"
"               To Nith River"
"             Maximum flow                  1.012    c.m/sec"
"             Hydrograph volume         15623.704    c.m"
"                    0.789     1.012     1.012     1.012"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.789     0.000     1.012     1.012"
" 81          ADD COMMENT==================================================="
"         2  Lines of comment"
"            Uncontrolled drainage from rear lot area to ex. culvert on "
"            Gerber Road (east of site)"
" 33          CATCHMENT 504"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"         504   Uncontrolled rear lot runoff"
"      65.000   % Impervious"
"       1.060   Total Area"
"      20.000   Flow length"
"      10.000   Overland Slope"
"       0.371   Pervious Area"
"      20.000   Pervious length"
"      10.000   Pervious slope"
"       0.689   Impervious Area"
"      20.000   Impervious length"
"      10.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      74.000   Pervious SCS Curve No."
"       0.730   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       8.924   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.970   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.149     0.000     1.012     1.012 c.m/sec"
"             Catchment 504          Pervious   Impervious Total Area "
"             Surface Area           0.371      0.689      1.060      hectare"
"             Time of concentration  7.742      1.384      3.217      minutes"
```

```
"             Time to Centroid       2496.608   2264.842   2331.668   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1057.35    1963.65    3021.00    c.m"
"             Rainfall losses        76.929     8.462      32.425     mm"
"             Runoff depth           208.071    276.538    252.575    mm"
"             Runoff volume          771.95     1905.35    2677.29    c.m"
"             Runoff coefficient     0.730      0.970      0.886      "
"             Maximum flow           0.050      0.099      0.149      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.149     0.149     1.012     1.012"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.149     0.149     0.149     1.012"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  1.160    c.m/sec"
"             Hydrograph volume         18301.000    c.m"
"                    0.149     0.149     0.149     1.160"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.149     0.000     0.149     1.160"
" 81          ADD COMMENT================================================="
"          1  Lines of comment"
"             Flows to the on-site SWM facility"
" 33          CATCHMENT 701"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          701   Commercial Block"
"       75.000   % Impervious"
"        2.550   Total Area"
"       20.000   Flow length"
"        1.000   Overland Slope"
"        0.638   Pervious Area"
"       20.000   Pervious length"
"        1.000   Pervious slope"
"        1.912   Impervious Area"
"       20.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       74.000   Pervious SCS Curve No."
"        0.731   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.924   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.964   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.366     0.000     0.149     1.160 c.m/sec"
"             Catchment 701          Pervious   Impervious Total Area "
"             Surface Area           0.638      1.912      2.550      hectare"
"             Time of concentration  15.448     2.761      5.320      minutes"
"             Time to Centroid       2507.523   2267.090   2315.580   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1816.88    5450.62    7267.50    c.m"
```

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"             Rainfall losses        76.743     10.214     26.847     mm"
"             Runoff depth           208.257    274.786    258.153    mm"
"             Runoff volume          1327.64    5255.28    6582.91    c.m"
"             Runoff coefficient     0.731      0.964      0.906      "
"             Maximum flow           0.089      0.287      0.366      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.366     0.366     0.149     1.160"
" 33          CATCHMENT 602"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          602   External Lands to SWM facility"
"        0.000   % Impervious"
"        6.110   Total Area"
"      150.000   Flow length"
"        1.000   Overland Slope"
"        6.110   Pervious Area"
"      150.000   Pervious length"
"        1.000   Pervious slope"
"        0.000   Impervious Area"
"      150.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.879   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.000   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.909     0.366     0.149     1.160 c.m/sec"
"             Catchment 602          Pervious   Impervious Total Area "
"             Surface Area           6.110      0.000      6.110      hectare"
"             Time of concentration  50.366     9.248      50.365     minutes"
"             Time to Centroid       2457.683   2277.995   2457.682   minutes"
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1.7413     0.0000     1.7413     ha-m"
"             Rainfall losses        34.391     7.165      34.391     mm"
"             Runoff depth           250.609    277.835    250.609    mm"
"             Runoff volume          1.5312     0.0000     1.5312     ha-m"
"             Runoff coefficient     0.879      0.000      0.879      "
"             Maximum flow           0.909      0.000      0.909      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.909     1.227     0.149     1.160"
" 33          CATCHMENT 702"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          702   Subdivision lands"
"       65.000   % Impervious"
"       31.140   Total Area"
"       50.000   Flow length"
"        1.000   Overland Slope"
"       10.899   Pervious Area"
"       50.000   Pervious length"
```

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"         1.000   Pervious slope"
"        20.241   Impervious Area"
"        50.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.732   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.976   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     4.512     1.227     0.149     1.160 c.m/sec"
"              Catchment 702          Pervious   Impervious Total Area "
"              Surface Area           10.899     20.241     31.140     hectare"
"              Time of concentration  26.769     4.784      11.105     minutes"
"              Time to Centroid       2523.653   2272.191   2344.494   minutes"
"              Rainfall depth         285.000    285.000    285.000    mm"
"              Rainfall volume        3.1062     5.7687     8.8749     ha-m"
"              Rainfall losses        76.419     6.701      31.102     mm"
"              Runoff depth           208.581    278.299    253.898    mm"
"              Runoff volume          2.2733     5.6331     7.9064     ha-m"
"              Runoff coefficient     0.732      0.976      0.891      "
"              Maximum flow           1.543      3.043      4.512      c.m/sec"
" 40           HYDROGRAPH Add Runoff "
"             4   Add Runoff "
"                     4.512     5.702     0.149     1.160"
" 33           CATCHMENT 703"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           703   SWM block "
"        85.000   % Impervious"
"         2.900   Total Area"
"         5.000   Flow length"
"         1.000   Overland Slope"
"         0.435   Pervious Area"
"         5.000   Pervious length"
"         1.000   Pervious slope"
"         2.465   Impervious Area"
"         5.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        74.000   Pervious SCS Curve No."
"         0.724   Pervious Runoff coefficient"
"         0.100   Pervious Ia/S coefficient"
"         8.924   Pervious Initial abstraction"
"         0.015   Impervious Manning 'n'"
"        98.000   Impervious SCS Curve No."
"         0.964   Impervious Runoff coefficient"
"         0.100   Impervious Ia/S coefficient"
"         0.518   Impervious Initial abstraction"
"                     0.406     5.702     0.149     1.160 c.m/sec"
"              Catchment 703          Pervious   Impervious Total Area "
"              Surface Area           0.435      2.465      2.900      hectare"
"              Time of concentration  6.724      1.202      1.848      minutes"
"              Time to Centroid       2493.450   2264.440   2291.244   minutes"
```

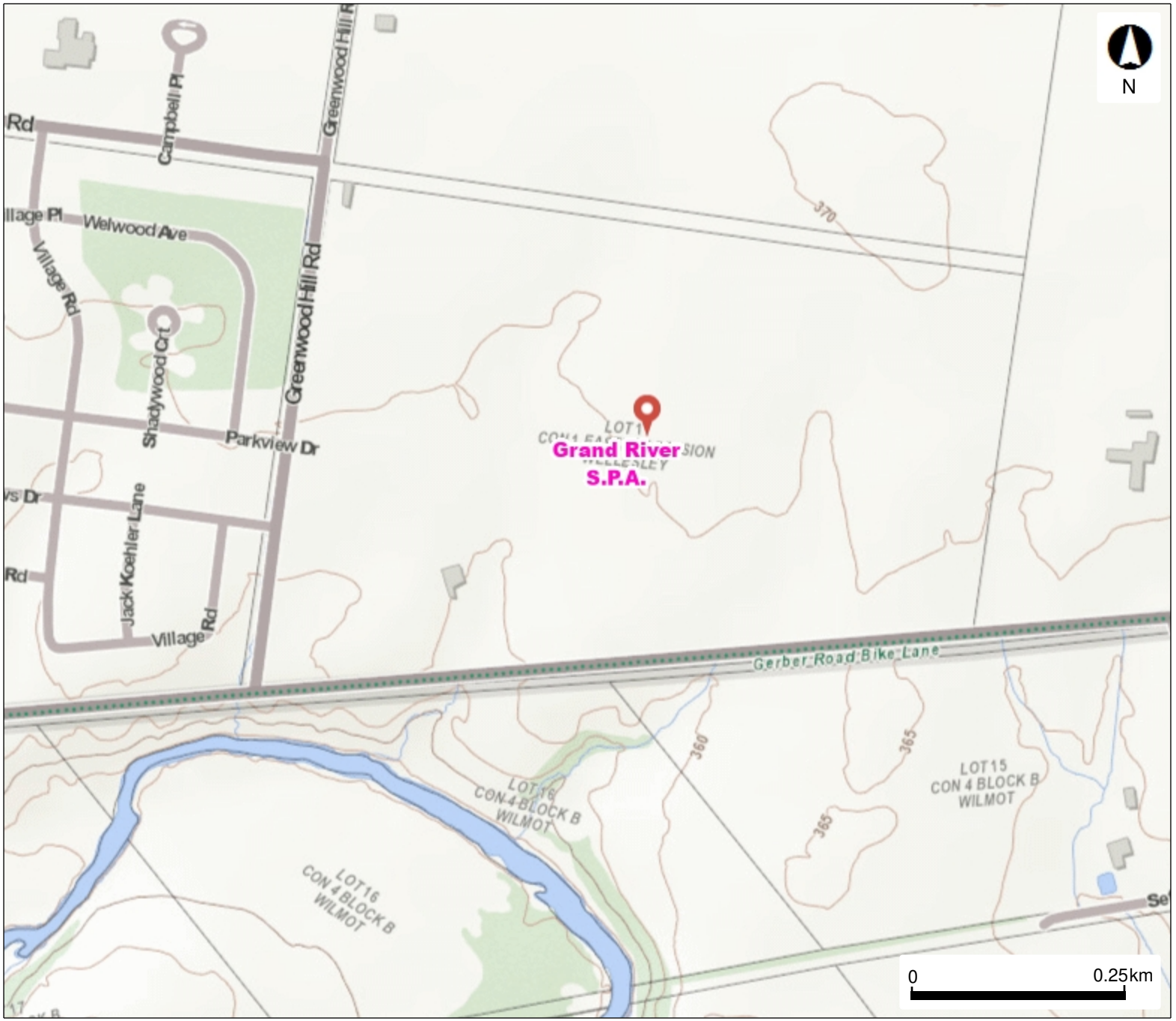
```
"             Rainfall depth         285.000    285.000    285.000    mm"
"             Rainfall volume        1239.75    7025.25    8265.00    c.m"
"             Rainfall losses        78.626     10.266     20.520     mm"
"             Runoff depth           206.374    274.734    264.480    mm"
"             Runoff volume          897.72     6772.20    7669.93    c.m"
"             Runoff coefficient     0.724      0.964      0.928      "
"             Maximum flow           0.059      0.347      0.406      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.406     6.106     0.149     1.160"
" 54          POND DESIGN"
"        6.106   Current peak flow    c.m/sec"
"        3.500   Target outflow    c.m/sec"
"     108628.9   Hydrograph volume    c.m"
"           8.   Number of stages"
"      356.700   Minimum water level    metre"
"      359.100   Maximum water level    metre"
"      356.700   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                356.700     0.000     0.000"
"                357.000   0.05305  2191.462"
"                357.300    0.1823  4539.618"
"                357.600    0.3245  7050.131"
"                358.000    0.7480  10658.73"
"                358.400     1.157  14577.91"
"                358.650     1.565  17190.84"
"                359.100     5.675  22222.57"
"           1.   WEIRS"
"                  Crest      Weir     Crest      Left     Right"
"              elevation coefficie   breadth sideslope sideslope"
"                358.650     0.900     7.500     1.000     1.000"
"           3.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                356.700     0.630    0.3750     1.000"
"                357.300     0.630    0.6000     1.000"
"                358.000     0.630    0.6000     1.000"
"           1.   LAYERS"
"                 Bottom    Aspect    Bottom       Top   Average"
"                   area     ratio elevation elevation sideslope"
"               7050.000     1.100   356.700   359.100     5.000"
"             Peak outflow                  5.572    c.m/sec"
"             Maximum level               359.089    metre"
"             Maximum storage           22096.332    c.m"
"             Centroidal lag               42.898   hours"
"                  0.406     6.106     5.572     1.160 c.m/sec"
" 40          HYDROGRAPH   Combine    111"
"            6   Combine "
"          111   Node #"
"                To Nith River"
"             Maximum flow                  6.643    c.m/sec"
"             Hydrograph volume        126928.648    c.m"
"                     0.406     6.106     5.572     6.643"
" 38          START/RE-START TOTALS 703"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      50.930    hectare"
"             Total Impervious area                     26.307    hectare"
"             Total % impervious                        51.653"
```

```
" 38          START/RE-START TOTALS 703"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      50.930    hectare"
"             Total Impervious area                     26.307    hectare"
"             Total % impervious                        51.653"
" 19          EXIT"
```

Appendix E: Historical Drawings and Pre-Submission Comments

Source Protection Mapping
Pre-Submission Comments
Municipal Drain Plan & Profile

1949 Gerber Road, Wellesley - Source Protection Mapping



Legend

- Issue Contributing Areas
- WHPA-E
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Event Based Areas
- Intake Protection Zone 2
- Source Protection Areas

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

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Map Created: 12/2/2025
Map Center: 43.4727 N, -80.74852 W

January 6, 2026
GEI Project No. 2507645

VIA EMAIL: bsoosaar@wellesley.ca

Bobby Soosaar
Township of Wellesley
4639 Lobsinger Line
St. Clements, ON N0B 2M0

Re: Pre-Submission Application PSM 09-25
1949 Gerber Road
Wellesley, Township of Wellesley, ON

Dear Mr. Soosaar:

Following our review of pre-submission application documents received on December 17, 2025, we are providing comments related to proposed zoning bylaw amendment, official plan amendment, and draft plan of subdivision applications on the subject lands located at 1949 Gerber Road Line in the Township of Wellesley.

It is our understanding that the proposed 9.849 ha development would consist of single detached homes, street townhouses, a commercial block, and a park block. The development would be accessed from Greenwood Hill Road, with two proposed accesses aligned with Parkview Drive and Gerber Meadows Drive.

The portion of the property to be developed is within the Township Urban Area/Designated Greenfield Area. The lands are zoned agricultural. The remaining 29 ha of the property is within the Prime Agricultural Area and has been requested to be included in the Urban Area through a settlement area boundary expansion.

The following documents were reviewed as part of this submission:

- PSM 05-25 Application.
- Concept Plan, prepared by MHBC, dated December 12, 2025.
- Cover Letter, prepared by MHBC, dated December 11, 2025.

From an engineering perspective, we provide the following requirements to support the zoning bylaw amendment, official plan amendment and draft plan of subdivision applications:

- **Geotechnical and Hydrogeological Studies**, providing information as required to support building and roadway design, stormwater management facility design and construction, utilities installation, etc.
- **Transportation Impact Study,** to include analysis of parking requirements and provisions, and analysis of proposed accesses including sightlines, turning lanes, if signalization is required, etc.
- **Legal Survey,** undertaken by a licensed Ontario Land Surveyor.
- **Topographic Survey and Existing Conditions Plan**, generally showing existing (pre-development) aboveground and underground infrastructure and grading.
- **Draft Plan of Subdivision.**
- **Conceptual Grading Plan**, generally showing proposed grading on the subject lands, and confirming legal drainage outlets.
- **Conceptual Servicing Plan**, generally showing proposed servicing infrastructure, including but not limited to watermain, sanitary sewers, storm sewers, associated structures, and stormwater management facilities.
- **Conceptual Profiles,** for roads and services, as necessary.
- **Stormwater Management Facility Plan,** with sections and details as necessary to support information provided in the Stormwater Management Report.
- **Storm and Sanitary Drainage Area Plans,** to support the storm and sanitary sewer design sheets provided in the Functional Servicing Report.
- **Functional Servicing and Stormwater Management Report**, detailing:
    - The existing conditions of the site and the nature of the proposed development.
    - How sanitary service will be provided for the development, including estimated flows, the conceptual design of proposed sewers, capacity review of existing sewers, and a review of the capacity of the Wellesley Wastewater Treatment Plant.
    - A water distribution system analysis to determine appropriate sizing of proposed watermains to adequately provide proposed domestic and fire flow demands in keeping with the Region of Waterloo and MECP pressure and velocity guidelines.
    - How stormwater management will be provided for the development including stormwater quality, quantity, erosion control and water balance, as required by the Township's CLI-ECA and Development Standards. Please note that the CLI-ECA for the Township's stormwater management system was issued on December 10, 2025. Appendix A – Stormwater Management Criteria is attached to this letter.
    - Grading and drainage considerations, including overland flow routes and legal outlet.
    - Storm and sanitary sewer design sheets. Sanitary and storm sewer to be assumed by the Township should be designed per the MECP's Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under an Environmental Compliance Approval (v.2.0, May 31, 2023).
    - Geotechnical and hydrogeological considerations.

- **GRCA Review,** the applicant is to provide conservation authority comments to the Township.
    - We note that the subject lands contain two small portions of regulated area to the south of the property.

Please note that reports and drawings should be stamped by qualified professionals.

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

GEI Consultants Canada Ltd.



Andrea Reed, P.Eng.
Project Engineer

Appendix A – Stormwater Management Criteria

1.0 Applicability of Criteria

1.1 The criteria listed under Table A1 of this Appendix applies to all drainage areas greater than 0.1 ha, with the construction erosion and sediment control criteria applying also to sites <0.1 ha;

1.2 Despite condition 1.1 of Appendix A, if some or all of the criteria listed under Table A1 of this Appendix have been assessed for and addressed in other adjacent developed lands to the project site through a subwatershed plan or equivalent study, then those criteria may not be applicable to the project site.

Table A1. Performance Criteria

Water Balance [1]	**FOR DEVELOPMENT SCENARIOS** [2] **Assessment Studies:** i) Control [3] as per the criteria identified in the water balance assessment completed in one or more of the following studies [15], if undertaken: a watershed/subwatershed plan; Source Protection Plan (Assessment Report component); Master Stormwater Management Plan, Master Environmental Servicing Plan; Class EA, or similar approach that transparently considers social, environmental and financial impacts; or local site study including natural heritage, Ecologically significant Groundwater Recharge Areas (EGRA), inflow and infiltration strategies. The assessment should include sufficient detail to be used at a local site level and consistent with the various level of studies; OR **IF Assessment Studies in i) NOT completed:** ii) Control [3] the recharge [4] to meet Pre-development [5] conditions on property; **OR** iii) Control [3] the runoff from the 90th percentile storm event. **Lake Simcoe Watershed Municipalities:** iv) Control [3] as per the evaluation of anticipated changes in water balance between Pre-development and post-development assessed through a Stormwater management plan in support of an application for Major Development [6]. The assessment should include sufficient detail to be used at a local site level. If it is demonstrated, using the approved water balance estimation methods **[7]**, that the site's post to Pre-development water balance cannot be met, and Maximum Extent Possible [8] has been attained, the proponent may use Lake Simcoe and Region Conservation Authority's (LSRCA) Recharge Compensation Program [9]. **FOR RETROFIT SCENARIOS** [10] **Assessment Studies:** i) Control as per criteria identified in the water balance assessment completed in one or more of the following studies: a watershed/subwatershed

	plan, Source Protection Plan (Assessment Report component), Master Stormwater Management Plan, Master Environmental Servicing Plan, Class EA, or local site study including natural heritage, EGRA, inflow and infiltration strategies, if undertaken. The assessment should include sufficient detail to be used at a local site level and consistent with the various level of studies; **OR** ii) If constraints [11] identified in i), then control [3] as per Maximum Extent Possible [8] based on environmental site feasibility studies or address local needs[14]. **IF Assessment Studies in i) NOT completed:** iii) Control [3] the recharge [4] to meet Pre-development [5] conditions on property; **OR** iv) Control [3] the runoff from the 90th percentile storm event.
Water Quality [1]	**FOR DEVELOPMENT SCENARIOS** [2] All of the following criteria must be met for development scenarios: **General:** i) Characterize the water quality to be protected and Stormwater Contaminants (e.g., suspended solids, nutrients, bacteria, water temperature) for potential impact on the Natural Environment, and control as necessary, **OR** ii) As per the watershed/subwatershed plan, similar area-wide Stormwater study, or Stormwater management plan to minimize, or where possible, prevent increases in Contaminant loads and impacts to receiving waters. **Suspended Solids:** i) Control [3] 90th percentile storm event and if conventional methods are necessary, then enhanced, normal, or basic levels of protection (80%, 70%, or 60% respectively) for suspended solids removal (based on the receiver). **Phosphorus:** i) Minimize existing phosphorus loadings to Lake Erie and its tributaries, as compared to 2018 or conditions prior to the proposed development, **OR** ii) Minimize phosphorus loadings to Lake Simcoe and its tributaries. Proponents with development sites located in the Lake Simcoe watershed shall evaluate anticipated changes in phosphorus loadings between Pre-development and post-development through a Stormwater management plan in support of an application for Major Development [6]. The assessment should include sufficient detail to be used at a local site level. If, using the approved phosphorus budget tool [12], it is demonstrated that the site's post to Pre-development phosphorus budget cannot be met, and Maximum Extent Possible [8] has been attained, the proponent may use LSRCA's Phosphorus Offsetting Policy [9]. **FOR RETROFIT SCENARIOS** [10] i) Improve the level of water quality control currently provided on site; **AND** ii) As per the 'Development' criteria for Suspended Solids, **OR** iii) **If 'Development' criteria for Suspended Solids cannot be met**, Works are designed as a multi-year retrofit project, in accordance with a rehabilitation study or similar area-wide Stormwater study, such that the completed treatment train will achieve the 'Development' criteria for

	Suspended Solids or local needs[14], within ten (10) years; **OR** iv) If constraints [11] identified in ii) and iii), then control [3] as per Maximum Extent Possible [8] based on environmental site feasibility studies.
Erosion Control (Watershed) [1]	**FOR DEVELOPMENT SCENARIOS** [8] i) As per erosion assessment completed in watershed/subwatershed plan, Master Stormwater Management Plan, Master Environmental Servicing Plan, Drainage Plan, Class EA, local site study, geomorphologic study, or erosion analysis; **OR** ii) As per the Detailed Design Approach or Simplified Design Approach methods described in the Stormwater Management Planning and Design Manual: a. The Detailed Design Approach may be selected by the proponent for any development regardless of size and location within the watershed provided technical specialists are available for the completion of the technical assessments; or considered more appropriate than the simplified approach given the size and location of the development within the watershed and the sensitivity of the receiving waters in terms of morphology and habitat function. b. The Simplified Design Approach may be adopted for watersheds whose development area is generally less than twenty hectares AND either one of the following two conditions apply: 1) The catchment area of the receiving channel at the point-of-entry of Stormwater drainage from the development is equal to or greater than twenty-five square kilometres; or 2) Meets the following conditions: ☐ The channel bankfull depth is less than three quarters of a metre; ☐ The channel is a headwater stream; ☐ The receiving channel is not designated as an Environmentally Sensitive Area (ESA) or Area of Natural or Scientific Interest (ANSI) and does not provide habitat for a sensitive aquatic species; ☐ The channel is stable to transitional; and ☐ The channel is slightly entrenched; **OR** iii) In the absence of a guiding study, detain at minimum, the runoff volume generated from a 25 mm storm event over 24 to 48 hours. **FOR RETROFIT SCENARIOS** [10] i) If approaches i-iii) under 'Development Scenarios' are not feasible as per identified constraints [11], then improve the level of erosion control [3] currently provided on site to Maximum Extent Possible [8] based on environmental site feasibility studies or address local needs[14].
Water Quantity (Minor and Major System) [1]	**i)** As per municipal standards, Master Stormwater Management Plan, Class EA, Individual EA and/or ECA, as appropriate for the type of project [13]
Flood Control	**FOR DEVELOPMENT SCENARIOS** [2]

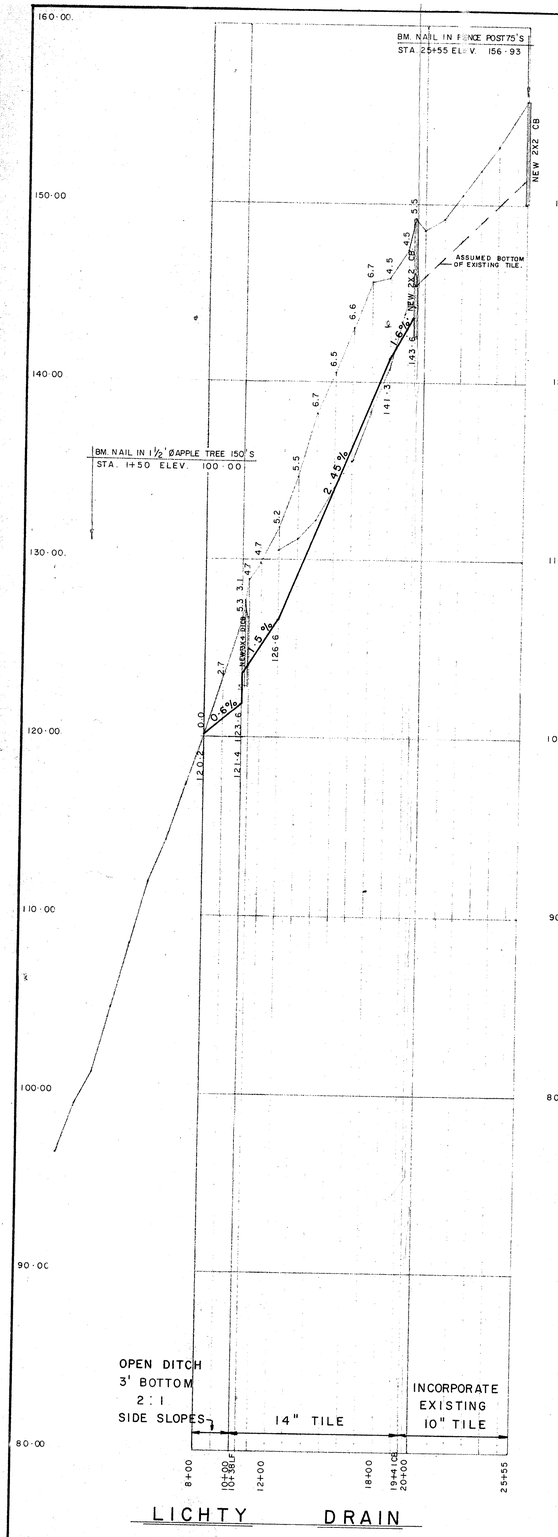
(Watershed Hydrology) [1]	i) Manage peak flow control as per watershed/subwatershed plans, municipal criteria being a minimum 100 year return storm (except for site-specific considerations and proximity to receiving water bodies), municipal guidelines and standards, Individual/Class EA, ECA, Master Plan, as appropriate for the type of project [13]. **FOR RETROFIT SCENARIOS** [10] i) If approaches i) under 'Development Scenarios' are not feasible as per identified constraints [11], then improve the level of flood control [3] currently provided on site to Maximum Extent Possible [8] based on environmental site feasibility studies.
Construction Erosion and Sediment Control	i) Manage construction erosion and sediment control through development and implementation of an erosion and sediment control (ESC) plan. The ESC plan shall: a. Have regard to Canadian Standards Association (CSA) W202 Erosion and Sediment Control Inspection and Monitoring Standard (as amended); OR b. Have regard to Erosion and Sediment Control Guideline for Urban Construction 2019 by TRCA (as amended). ii) Be prepared by a QP for sites with drainage areas greater than 5 ha or if specified by the Owner for a drainage lower than 5 ha. iii) Installation and maintenance of the ESC measures specified in the ESC plan shall have regard to CSA W208:20 Erosion and Sediment Control Installation and Maintenance (as amended). iv) For sites with drainage areas greater than 5 ha, a QP shall inspect the construction ESC measures, as specified in the ESC plan.
Footnote	1. Where the opportunity exists on your project site or the same subwatershed, reallocation of development elements may be optimal for management as described in footnote [3]. 2. Development includes new development, redevelopment, infill development, or conversion of a rural cross-section into an urban cross-section. 3. Stormwater volumes generated from the geographically specific 90th percentile rainfall event on an annual average basis from all surfaces on the entire site are targeted for control. Control is in the following hierarchical order, with each step exhausted before proceeding to the next: 1) retention (infiltration, reuse, or evapotranspiration), 2) LID filtration, and 3) conventional Stormwater management. Step 3, conventional Stormwater management, should proceed only once Maximum Extent Possible [8] has been attained for Steps 1 and 2 for retention and filtration. 4. Recharge is the infiltration and movement of surface water into the soil, past the vegetation root zone, to the zone of saturation, or water table. 5. Pre-development is defined as the more stringent of the two following scenarios: 1) a site's existing condition, or 2) as defined by the local municipality. 6. Major Development has the same meaning as in the Lake Simcoe Protection Plan, 2009. 7. Currently, the approved tool by LSRCA for calculating the water balance is the Thornthwaite-Mather Method. Other tools agreed upon by relevant approval agencies (e.g., LSRCA, municipality, or Ministry) may also be acceptable, subject to written acceptance by the Director. 8. Maximum Extent Possible means maximum achievable Stormwater volume control through retention and LID filtration engineered/landscaped/technical Stormwater practices, given the site constraints [11]. 9. Information pertaining to LSRCA's Recharge Compensation Program and Phosphorus Offsetting Policy is available on LSRCA's website

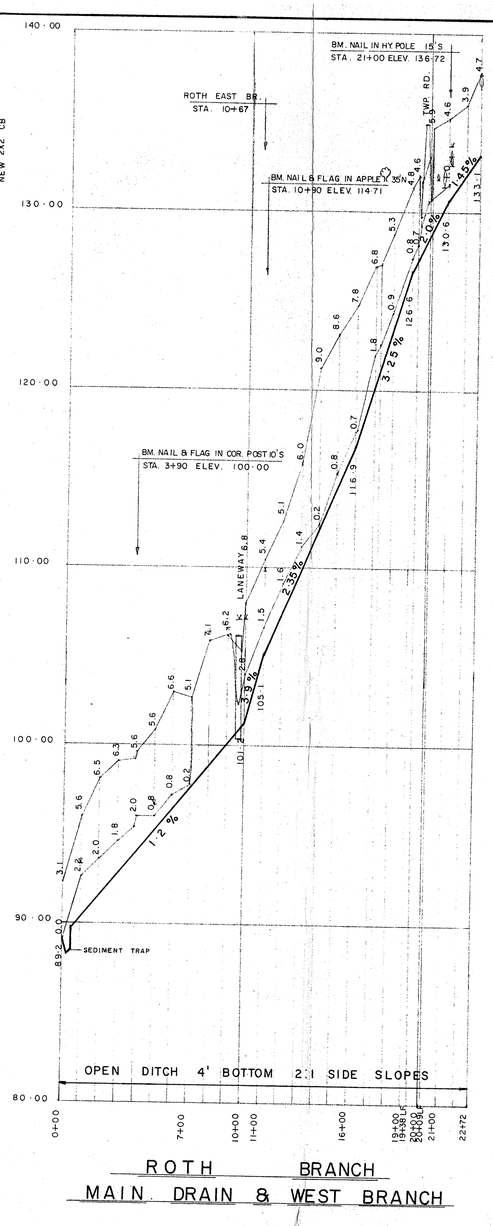
	(lsrca.on.ca), or in “Water Balance Recharge Policy for the Lake Simcoe Protection Plan”, dated July 2021, and prepared by Lake Simcoe Region Conservation Authority and “Phosphorus Offsetting Policy”, dated July 2021, and prepared by Lake Simcoe Region Conservation Authority. 10. Retrofit means: 1) a modification to the management of the existing infrastructure, 2) changes to major and minor systems, or 3) adding Stormwater infrastructure, in an existing area on municipal right-of-way, municipal block, or easement. It does not include conversion of a rural cross-section into an urban cross-section. 11. Site constraints must be documented. A list of site constraints can be found in Table A2. 12. Tools for calculating phosphorus budgets may include the Ministry’s Phosphorus Tool, the Low Impact Development Treatment Train Tool developed in partnership by TRCA, LSRCA, and Credit Valley Conservation (CVC), or other tools agreed upon by the LSRCA and other relevant approval agencies including the municipality. 13. Possible to look at combined grey infrastructure and LID system capacity jointly. 14. Local needs include requirements for water quality, erosion, and/or water balance retrofits identified by the owner through ongoing operation and maintenance of the stormwater system, including inspection of local receiving systems and the characterization of issues requiring remediation through retrofit controls. 15. All studies shall conform with Ministry policies. If any conclusions in the studies negate policy, then the project will require a direct submission to the Ministry for review through an application pertaining to a Schedule C Notice.

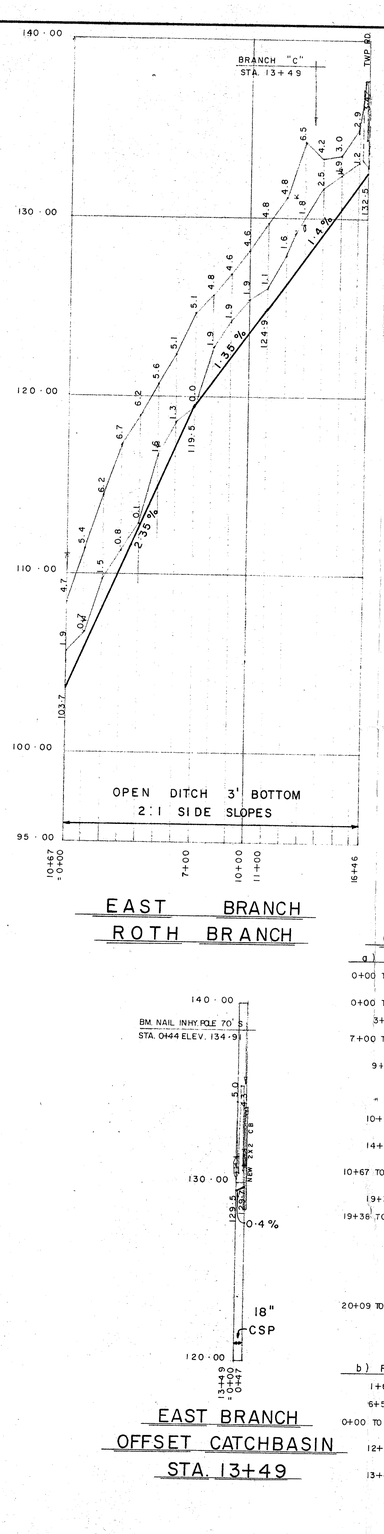
Table A2. Stormwater Management Practices Site Constraints

Site Constraints	
a)	Shallow bedrock [1], areas of blasted bedrock [2], and Karst;
b)	High groundwater [1] or areas where increased infiltration will result in elevated groundwater levels which can be shown through an appropriate area specific study to impact critical utilities or property (e.g., susceptible to flooding);
c)	Swelling clays [3] or unstable sub-soils;
d)	Contaminated soils (e.g., brownfields);
e)	High Risk Site Activities including spill prone areas;
f)	Prohibitions and or restrictions per the approved Source Protection Plans and where impacts to private drinking water wells and /or Vulnerable Domestic Well Supply Areas cannot be appropriately mitigated;
g)	Flood risk prone areas or structures and/ or areas of high inflow and infiltration (I/I) where wastewater systems (storm and sanitary) have been shown through technical studies to be sensitive to groundwater conditions that contribute to extraneous flow rates that cause property flooding / Sewer back-ups;
h)	For existing municipal rights-of-way infrastructure (e.g., roads, sidewalks, utility corridor, Sewers, LID, and trails) where reconstruction is proposed and where surface and subsurface areas are not available based on a site-specific assessment completed by a QP;
i)	For developments within partially separated wastewater systems where reconstruction is proposed and where, based on a site-specific assessment completed by a

QP, can be shown to: i Increase private property flood risk liabilities that cannot be mitigated through design; ii Impact pumping and treatment cost that cannot be mitigated through design; or iii Increase risks of structural collapse of Sewer and ground systems due to infiltration and the loss of pipe and/or pavement support that cannot be mitigated through design.
j) Surface water dominated or dependent features including but not limited to marshes and/or riparian forest wetlands which derive all or a majority of their water from surface water, including streams, runoff, and overbank flooding. Surface water dominated or dependent features which are identified through approved site specific hydrologic or hydrogeologic studies, and/or Environmental Impact Statements (EIS) may be considered for a reduced volume control target. Pre-consultation with the MECP and local agencies is encouraged;
k) Existing urban areas where risk to water distribution systems has been identified through assessments to meet applicable drinking water requirements, including Procedures F-6 and F-6-1, and substantiated by a QP through an appropriate area specific study and where the risk cannot be reasonably mitigated per the relevant design guidelines;
l) Existing urban areas where risk to life, human health, property, or infrastructure has been is identified and substantiated by a QP through an appropriate area specific study and where the risk cannot be reasonably mitigated per the relevant design guidelines;
m) Water reuse feasibility study has been completed to determine non-potable reuse of Stormwater for onsite or shared use;
n) Economic considerations set by infrastructure feasibility and prioritization studies undertaken at either the local/site or municipal/system level [4].
Footnote: 1. May limit infiltration capabilities if bedrock and groundwater is within 1m of the proposed Facility invert per Table 3.4.1 of the LID Stormwater Planning and Design Guide (2010, V1.0 or most recent by TRCA/CVC). Detailed assessment or studies are required to demonstrate infiltration effects and results may permit relaxation of the minimum 1m offset. 2. Where blasting is more localized, this constraint may not be an issue elsewhere on the property. While infiltration-based practices may be limited in blasted rock areas, other forms of LID, such as filtration, evapotranspiration, etc., are still viable options that should be pursued. 3. Swelling clays are clay soils that is prone to large volume changes (swelling and shrinking) that are directly related to changes in water content. 4. Infrastructure feasibility and prioritization studies should comprehensively assess Stormwater site opportunities and constraints to improve cost effectiveness, environmental performance, and overall benefit to the receivers and the community. The studies include assessing and prioritizing municipal infrastructure for upgrades in a prudent and economically feasible manner.







CONSTRUCTION NOTES

a) ROTH WEST BRANCH

0+00 TO 3+90 – CLEAR AND GRUB WILLOWS AND PILE DEBRIS IN WINDROW.

0+00 TO 0+50 – DIG DITCH 12" DEEPER TO ALLOW FOR SEDIMENT TRAP

3+80 ± – PLACE 50 LINEAL FEET OF BANK RIPRAP AT BEND.

7+00 TO 9+50 – DITCH TO BE REALIGNED TO STRAIGHTEN OUT.
– USE MATERIALS TO FILL IN OLD CHANNEL.

9+70 – REMOVE OLD CONCRETE CROSSING AND USE AS RIPRAP ON SOUTHSIDE AT START OF RELOCATION DOWNSTREAM FROM CROSSING TO PROTECT FILL PUT IN OLD DITCH.
– INSTALL NEW 40' LENGTH OF 8'0" X 5'9" ARCH STRUCTURAL PLATE CORRUGATED STEEL PIPE CULVERT 12 GA. AT SKEW.

" –

10+17 – PLACE 50 LINEAL FEET OF BANK RIPRAP ON WEST BANK OPPOSITE EAST BRANCH ENTRANCE.

14+10 – PLACE 50 LINEAL FEET OF BANK RIPRAP ON EAST BANK AT BEND.

10+67 TO 19+38 – CLEAR AND GRUB ALL TREES AND PILE NEATLY FOR OWNERS DISPOSAL.

19+38 – CAUTION BELL CABLE.

19+38 TO 20+09 – REMOVE EXISTING ROAD CULVERT AND LEAVE FOR TOWNSHIPS SALVAGE.
– PLACE NEW 60 FOOT LENGTH OF 48" CSP 12 GA. ON SKEW UNDER ROAD WITH COMPACTED GRANULAR BACKFILL SURFACE WITH 6" OF CRUSHED GRAVEL, KEEP 3" BELOW GRADE.
– PLACE 30 FEET OF RIPRAP PROTECTION ON BEND ON UPSTREAM SIDE OF CULVERT AND 30 FEET ON DOWNSTREAM SIDE.

20+09 TO 22+72 – CLEAN APPROXIMATELY 12 INCHES OUT OF DITCH BOTTOM AND LEVEL ON ADJACENT FIELD AND WIDEN CHANNEL OUT.
– RELOCATE TILE OUTLETS AS NECESSARY.
– LEAVE ROADSIDE BANK ALONE.

b) ROTH EAST BRANCH

1+60 – PLACE 50 LINEAL FEET OF BANK PROTECTION AT BEND.

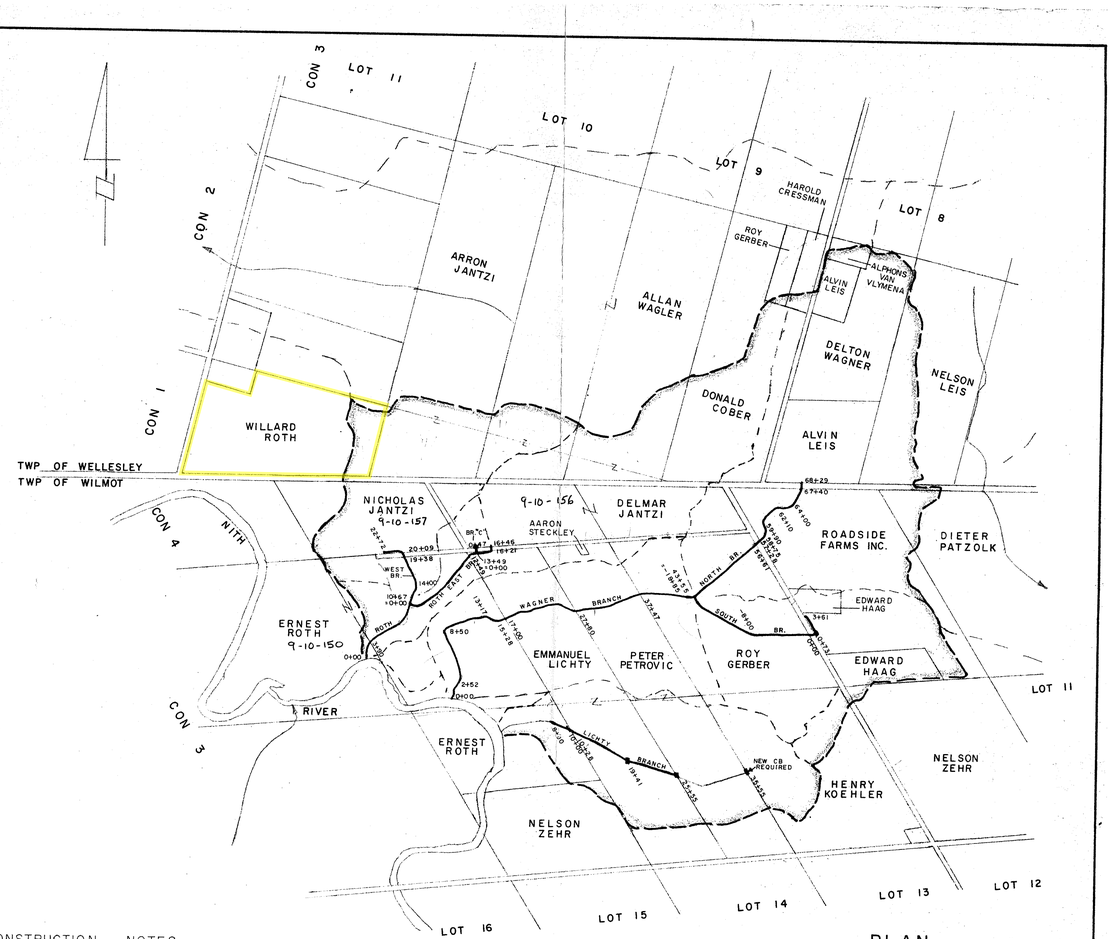
6+50 – PLACE 50 LINEAL FEET OF BANK PROTECTION AT BEND.

0+00 TO 12+49 – REMOVE SCATTERED TREES, & PILE NEATLY AND LEAVE FOR OWNERS DISPOSAL.

12+49 – PLACE 50 LINEAL FEET OF BANK PROTECTION AT BEND.
– CLEAN SMALL DITCH UP TO ROAD CULVERT.

13+49 – PLACE 50 FEET OF 18" DIA. CSP 16 GA. ACROSS TOWNSHIP ROAD BY OPEN CUT AND WITH GRANULAR (IMPORTED) BACKFILL. (see Branch C).
– PLACE RODENT GATE AT OUTLET AND PLACE 2X2 CB AT TOP END. CONNECT UP EXISTING 12" TO CB AND 8" OUTLET DIRECTLY TO PIPE.

16+20 – CLEAN THROUGH EXISTING ROAD CULVERT.



PLAN SCALE: 1"= 1000'

c) LICHTY BRANCH

8+00 TO 10+00 – EXCAVATE OPEN DITCH AND LEVEL MATERIAL ON ADJACENT LANDS.

10+00 – PLACE 20' OF 18" DIA. CSP 16 GA. ON TILE OUTLET WITH RODENT GATE.
– CONSTRUCT OVERFLOW 3X4 DICB WITH 14 FT. OF 30" DIA. CSP 14 GA. OVERFLOW PIPE. KEEP BAR SPACING AT 6" MIN. IN CB GRILLE AND PLACE 300 SQ. FT. OF HEAVY STONE OR CONCRETE RIPRAP AROUND CB AND BANK SLOPES. (as per detail)

10+00 TO 19+41 – PLACE NEW 14" TILE DRAIN AND BACKFILL OLD RUN. VERIFY SIDE FOR INSTALLATION WITH OWNER.

17+90 – CONNECT UP TILE ON NORTH BANK. MATERIALS TO BE PAID EXTRA.

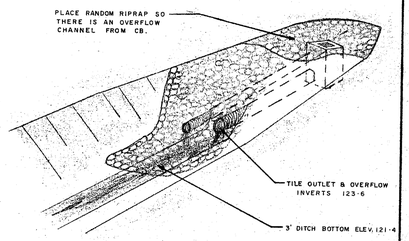
18+30 – CONNECT UP TILE ON SOUTH BANK. MATERIALS TO BE PAID EXTRA.

19+41 – PLACE CATCHBASIN AT OLD TILE OUTLET AND CONNECT UP OLD TILE.

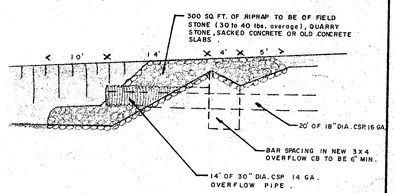
25+55 – PLACE CB ON EXISTING DRAIN AT FENCELINE.
35+55 ± – LOCATE 6" TILE DRAIN APPROXIMATELY 1000 FEET UPSTREAM AT WEST EDGE OF BUSH AND INSTALL NEW 2X2 CB ON THE DRAIN, KEEP TOP LOW TO MATCH GROUND LEVEL.

GENERAL NOTES

1. WHERE POSSIBLE LEAVE ALL GRASSED BANKS ALONE.
2. WHERE STONES ARE ENCOUNTERED HEAVIER THAN MAN CAN READILY LIFT, PUSH, SAME TO DITCH SIDE OF SPOIL BANK BUT KEEP 5' MIN. AWAY FROM DITCH.
3. ALL LANE CULVERTS TO BE 6" BELOW GRADE, TO HAVE 18'–20' PLATFORM, AND TO HAVE NATIVE SODS PUT ON EACH SLOPE. USE GOOD CLAY MATERIALS FOR BACKFILL.
4. FOR BANK RIPRAP EITHER 6'X 3'X 3' GABION BASKETS FILLED WITH APPROPRIATE QUARRY STONE (see specs.) OR 14'4"X 4'5" GOBIMATS AS MADE BY GOBIMAT OF CHATHAM (see specs.) SHALL BE USED.



PERSPECTIVE



SECTION

DETAIL FOR TILE OUTLET AT STA. 10+00 LICHTY BRANCH

PROFILES:

SCALE: HOR 1"= 400'
VER 1"= 4'

K. A. SMART PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

LICHTY, WAGNER, ROTH DRAIN

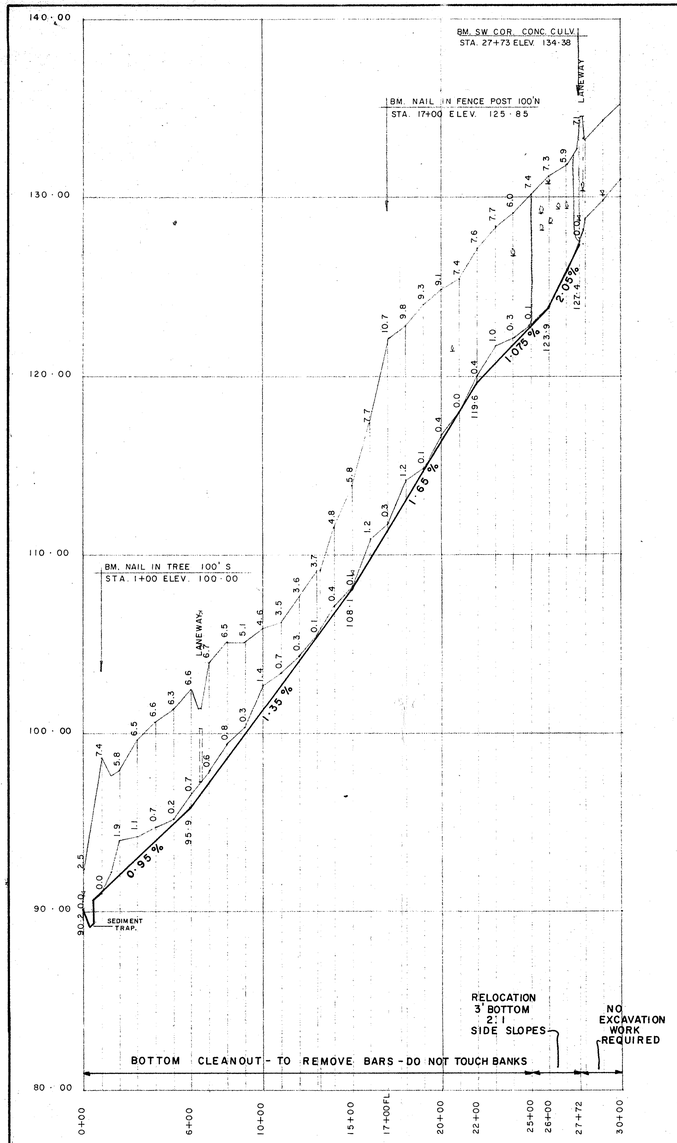
TOWNSHIP OF WILMOT

SCALE: AS SHOWN	F.B. DR-12	JOB NO. 76081	DRAWN BY: H.A.W.
DATE: JULY 8, 1977			REVISED:

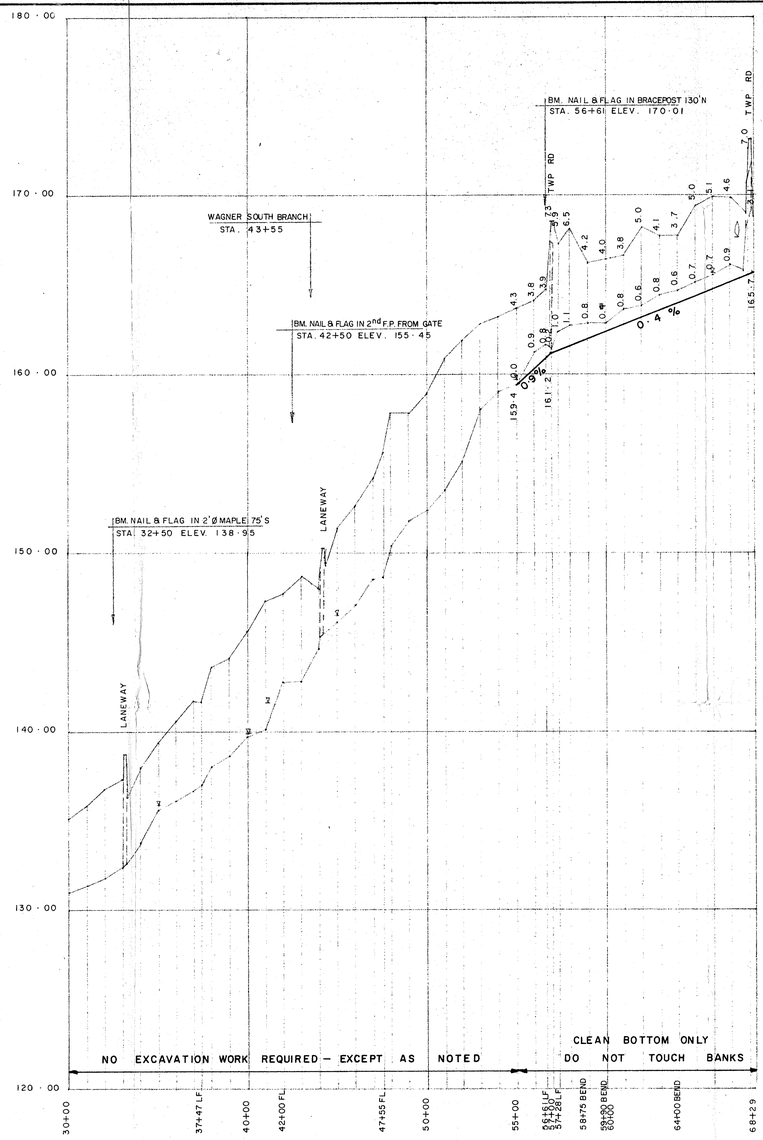
PLAN AND PROFILES

K. SMART CONSULTING ENGINEER & PLANNER
460 FREDERICK ST. KITCHENER, ONT.

DRAWING NUMBER 1 OF 2



WAGNER BRANCH
MAIN DRAIN AND NORTH BRANCH



WAGNER BRANCH - MAIN DRAIN
AND NORTH BRANCH CONT'D

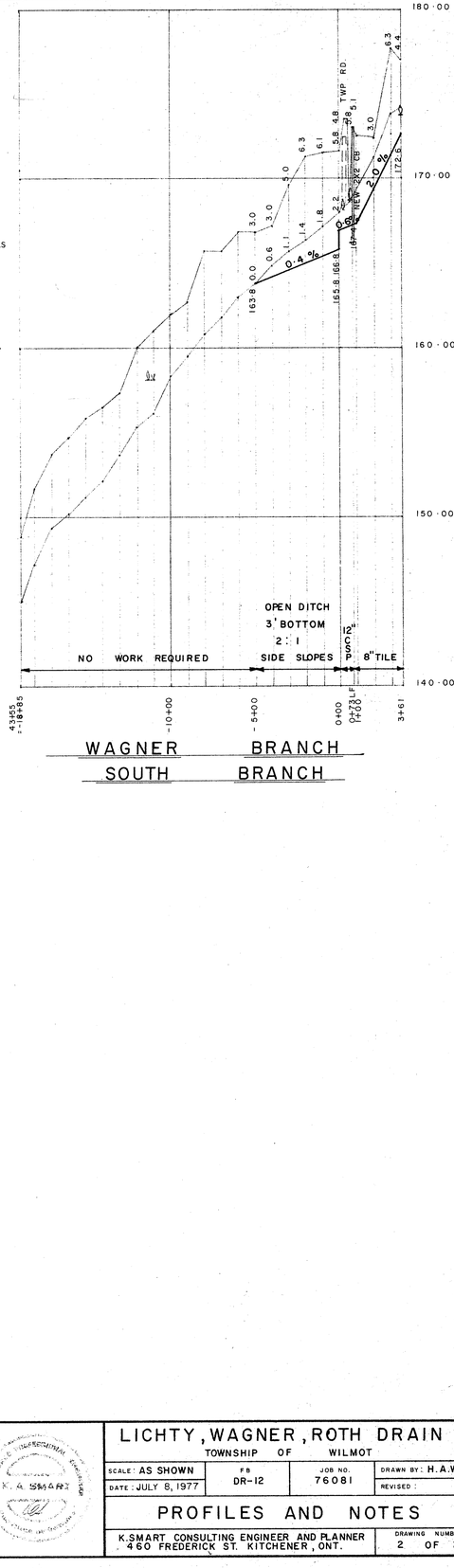
CONSTRUCTION NOTES

a) WAGNER NORTH BRANCH

0+00 TO 0+50	– DIG BOTTOM 12" DEEPER TO ALLOW SEDIMENT TRAP.
0+00 TO 17+00	– CLEARING AND GRUBBING REQUIRED ON BOTH SIDES. – CLEAR SUFFICIENT ON BUSH SIDE TO ALLOW FOR WINDROW OF ALL CLEARED TREES PLUS LEVELLING OF MATERIAL. – ONLY REMOVE MINIMUM AMOUNT FROM BOTTOM AND DO NOT TOUCH BANKS.
1+49, 2+52, 8+50, 13+17 & 15+28	– PLACE 50 LINEAL FEET OF BANK PROTECTION AT EACH OF THESE BEND LOCATIONS TO PROTECT BANK.
6+47	– REMOVE EXISTING CULVERTS AND REPLACE WITH 30' LENGTH OF 8'0"X5'9" 12 GA. ARCH STRUCTURAL PLATE CORRUGATED STEEL PIPE 6" BELOW GRADE. – RECONSTRUCT LANE AND APPROACHES.
17+00 TO 25+00	– BAR REMOVAL AND BOTTOM STRAIGHTENING ONLY. – CHANNEL STRAIGHTENING REQUIRED TO CHECK EROSION. – REMOVE SCRUB ALONG BANKS.
25+00 TO 27+60	– RELOCATE CHANNEL TO WEST TO FLATTEN OUT BENDS. – IF IT IS NECESSARY TO EXTEND ANY TILES TO NEW BANK, SUCH MATERIALS AND LABOUR TO BE PAID EXTRA. – BOTH UPSTREAM AND DOWNSTREAM BENDS TO BE PROTECTED WITH 50 LINEAL FEET OF BANK PROTECTION EACH.
37+47 TO 41+00	– CLEAR AND GRUB THOSE TREES ALREADY COLLAPSED INTO CHANNEL AND THOSE THAT WILL COLLAPSE, LEAVE IN NEAT PILES FOR OWNER'S DISPOSAL. – REGRADE CHANNEL BANKS.
42+00	– REMOVE STONE DAM FROM BOTTOM & PULL OVER TO SIDE.
49+00 TO 53+00	– THERE ARE 4 LOCATIONS HERE WHERE BANK NEEDS RIPRAP PROTECTION IN THE FORM OF HEAVY STONES, OLD CONCRETE SLABS OR SACKED CONCRETE. – EXCAVATE SOME OF BANK FIRST BY BACKHOE PRIOR TO PLACING RIPRAP. – APPROXIMATELY 50 SQUARE FEET OF BANK PROTECTION REQUIRED AT EACH LOCATION. – THERE IS ONE LOCATION WHERE OLD CONCRETE TO BE REMOVED FROM DITCH BOTTOM.
55+00 TO 68+29	– BOTTOM CLEANOUT REQUIRED.
55+80	– CLEAN THROUGH EXISTING ROAD CULVERT.
68+20	– REMOVE EXISTING ROAD CULVERT AND REPLACE WITH 50' OF 48" DIA. CSP 12 GA. AND COMPACTED GRANULAR BACKFILL. – PLACE 50 LINEAL FEET OF BANK PROTECTION AT UPSTREAM SIDE OF CULVERT ALONG FIELD SIDE OF SLOPE TO PROTECT AGAINST EROSION.

b) WAGNER SOUTH BRANCH

0+00 TO-5+00	– EXCAVATE EXISTING DITCH AND LEVEL MATERIAL ON ADJACENT LANDS.
0+00 TO 0+70	– PLACE 70' OF 12" CSP 16 GA. WITH RODENT GATE UNDER TOWNSHIP ROAD BY OPEN CUT AND WITH GRANULAR BACKFILL. – PLACE 100 SQUARE FEET OF RIPRAP AROUND TILE OUTLET AND AS DOWNSTREAM APRON.
0+70	– CONSTRUCT NEW 2X2 CB AND CONNECT UP EXISTING TWO EXISTING TILES WITH 20 FEET OF 8" TILE AND 20' OF 6" TILE.
0+70 TO 3+61	– STAY ON FIELD SIDE OF FENCELINE.
3+61	– CONNECT TO EXISTING 6" TILE.



WAGNER BRANCH
SOUTH BRANCH

PROFILES
SCALE: HOR 1"= 400'
VER 1"= 4'

LICHTY, WAGNER, ROTH DRAIN TOWNSHIP OF WILMOT			
SCALE: AS SHOWN	FB DR-12	JOB NO. 76081	DRAWN BY: H.A.W.
DATE: JULY 8, 1977			REVISED:
PROFILES AND NOTES			
K.SMART CONSULTING ENGINEER AND PLANNER 460 FREDERICK ST. KITCHENER, ONT.			DRAWING NUMBER 2 OF 2

Appendix F: Geotechnical Correspondence

From: Yaroslav Chudin <yaroslav.chudin@cvdengineering.com>
Sent: August 12, 2026 1:02 PM
To: Alexander Orakwue
Cc: Christopher Togeretz; Chris Uzoewulu; mark.marriner; peter.dao; nandou.zhao
Subject: RE: RE: 1949 Gerber Road - Request for Quotation - JQ4599
Attachments: WT2621353 Your Reference 1949 GERBER ROAD WATERLOO (WELLESLEY) Final Version 0 - Merged.pdf; 3211 BH Logs (Draft).pdf; 3211 Grain Sizes (Draft).pdf; Table 1 - Water Levels - 3211H (Draft).pdf; BH Location Plan - 3211G (Draft).pdf; Figure 1 - Water Table Contours (July 9, 2026) - 3211H Draft.pdf

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Good afternoon Alexander,

Attached are our draft borehole logs, grain size analyses, chemical testing results for SAR and EC, the preliminary water table with our first round of groundwater measurements, and our interpreted groundwater contour map based on those readings.

In terms of the findings, shallow groundwater generally follows the topography of the site and travels towards the south. The water table ranges in elevation across the site between 353.08 mASL at the southern end to 363.96 mASL at the northern end of the property (depths between 0.98 to 2.80 m below ground surface (mbgs)). As such, the groundwater table is quite shallow throughout a large portion of the site, and it is probable that excavations will intercept the water table. However, given that the soils are predominantly comprised of very low permeable silty clay, with the exception of occasional minor granular seams (sand and silt), only limited seepage is anticipated during excavations. Any seepage can be controlled using conventional filtered sump pumps.

It should also be noted that due to this very low permeability of the underlying silty clay soils, infiltration will likely be very difficult to implement. We didn't encounter any pockets of more permeable material in any of our boreholes.

Topsoil was difficult to distinguish from the underlying reworked materials, which isn't surprising considering that this is an agricultural field. The topsoil/reworked materials extended to depths between 0.60 to 0.90 mbgs and also occasionally contained wood fragments.

Foundations may generally be constructed below the topsoil/reworked layer on competent silty clay soils or engineered fill with a bearing capacity of 150 kPa at SLS and 225 kPa ULS. Excavated native inorganic silty clay soils are generally considered suitable for a reuse as engineered fill, subject to moisture conditioning.

In terms of chemical testing of the soils, there were no exceedances for EC and SAR.

We will work on the final geotechnical report and aim to send it you by the end of next week or Monday the following week. Please let me know is you require any more immediate information or if you have any questions regarding the information provided in this email.

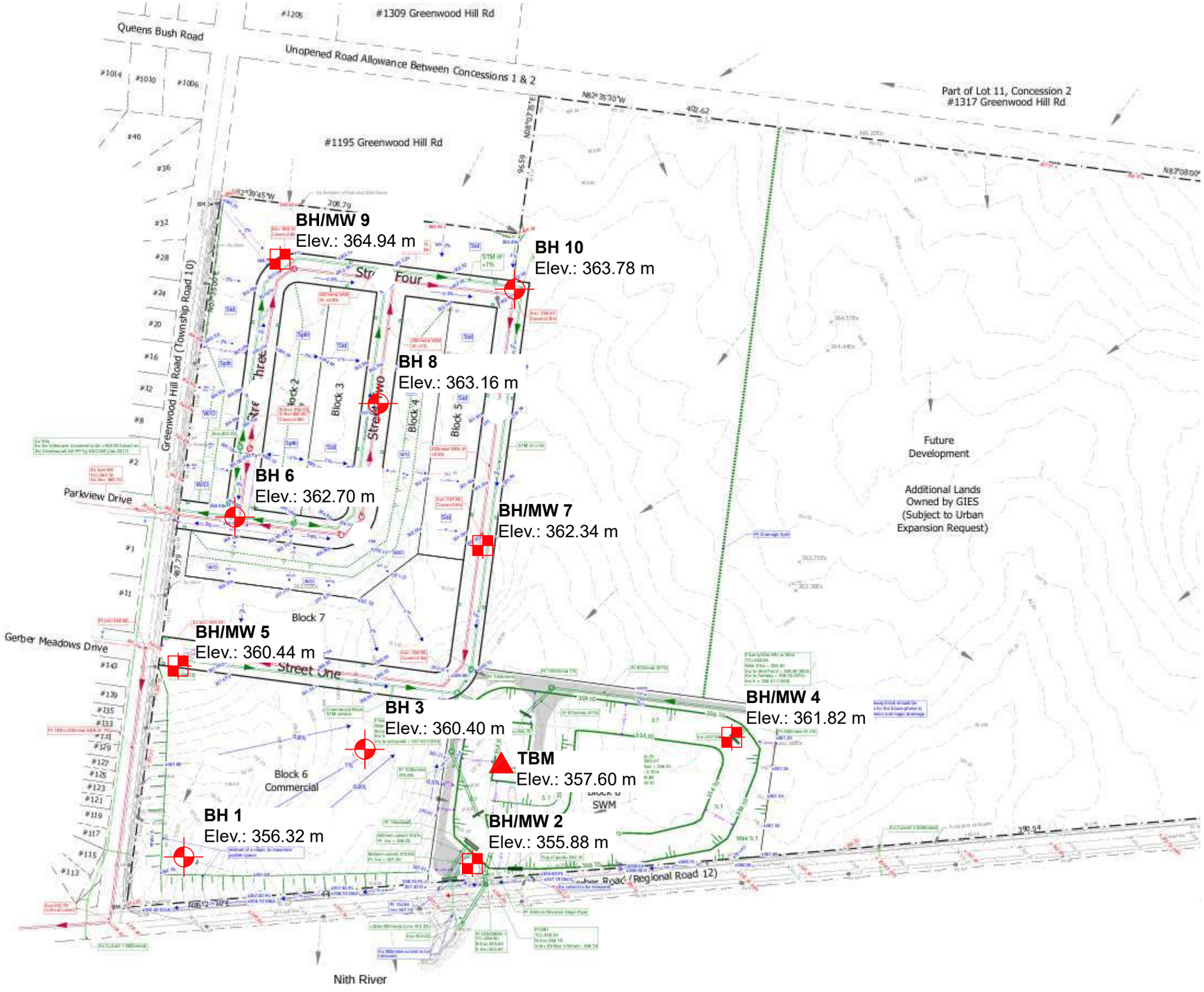
With regards,

Yaroslav Chudin | BASc., P.Eng.
Project Engineer
yaroslav.chudin@cvdengineering.com
311 Victoria Street North, Kitchener, ON, N2H 5E1
O: 519 742 8979
C: 519 807 6254



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KEY PLAN **SOURCE:** Google Earth

LEGEND

TBM: Orange painted nail located in South entrance to farm field.
Elev: 357.60m (Geodetic)

Borehole Location

Monitoring Well Location

Elev. Ref.: CVD borehole locations and associated ground surface elevations were surveyed using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

DWG. Ref.: Meritech Engineering; "Overall Grading and Servicing Concept Plan", 1949 Gerber Road, Wellesley, Ontario; Rev No.: 4599.DPA; Dated: May 22, 2026.

BOREHOLE & MONITORING WELL LOCATION PLAN

Proposed Development

1949 Gerber Road
Wellesley, Ontario

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1 / 519-742-8979

Drawn By: RP	Date: July 2026	File No.: 3211G
Checked By:	Scale: 1:1000	Drawing No.: 1

FILE No: 3211G

BOREHOLE No. 1

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Hollow Stem Augers**
Size: **108 mm I.D.**
Date: **Jul 02 - 26** TO **Jul 02 - 26**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	SHEAR STRENGTH (kPa) / PENETRATION RESISTANCE	WATER CONTENT (%)	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **356.32 m**						FIELD VANE: Peak ⊗ Rem. ×; LAB TEST: Unc. ■ P.P. □; 50 100 150 200; STANDARD ● DYN. CONE ○; 20 40 60 80	W_P W W_L; 10 20 30			
	loose, dark brown FILL silty sand (ploughed surface) some topsoil, trace clay occ. rootlets, moist	0.5		1	SS	8				0.5	
355.72											
0.60	stiff to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to APL	1.0		2	SS	11				1.0	
		1.5		3	SS	14				1.5	
		2.0								2.0	
		2.5		4	SS	13				2.5	
	-------- grey	3.0								3.0	
		3.5		5	SS	18				3.5	
		4.0		6	SS	17				4.0	
351.77		4.5								4.5	borehole open and dry upon removal of augers; auger refusal at 4.55 mbgs
4.55	End of Borehole	5.0								5.0	
		5.5								5.5	
		6.0								6.0	
		6.5								6.5	
		7.0								7.0	
		7.5								7.5	
		8.0								8.0	
		8.5								8.5	

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 2

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Hollow Stem Augers**
Size: **108 mm I.D.**
Date: **Jul 02 - 26** TO **Jul 02 - 26**

Ground Elevation: **355.88 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SAMPLE ID	TYPE	N-VALUE
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay occ. wood fragments moist	0.5	1	SS	8
354.93					
0.95	firm to very stiff, brown SILTY CLAY trace gravel, trace sand occ. sand seams DTPL to APL	1.0	2	SS	7
	--------	1.5			
	sandy	2.0	3	SS	17
	--------	2.5	4	SS	25
	--------	3.0			
	grey	3.5	5	SS	27
	--------	4.0	6	SS	20
	silt seam	4.5			
	--------	5.0	7	SS	16
		5.5			
		6.0			
349.18		6.5	8	SS	14
6.70	End of Borehole	7.0			
		7.5			
		8.0			
		8.5			

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS

- above grade monument casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- 3.05 m long, 50 mm I.D. PVC screen with sandpack
- water level in monitoring well measured at 2.80 m depth (353.08 mASL) on July 9, 2026

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
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FILE No: 3211G

BOREHOLE No. 3

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Solid Stem Augers**
Size: **152 mm O.D.**
Date: **Jul 03 - 26** TO **Jul 03 - 26**

Ground Elevation: **360.40 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil trace clay moist	0.5		1	SS	7
359.50						
0.90	firm to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to APL	1.0		2	SS	9
		1.5				
		2.0		3	SS	19
	-------- grey	2.5		4	SS	17
		3.0				
		3.5		5	SS	9
	-------- occ. sand seams	4.0		6	SS	9
		4.5				
		5.0		7	SS	6
		5.5				
		6.0				
		6.5		8	SS	17
353.70						
6.70	End of Borehole	7.0				
		7.5				
		8.0				
		8.5				

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 4

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Hollow Stem Augers**
Size: **108 mm I.D.**
Date: **Jul 02 - 26** TO **Jul 02 - 26**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **361.82 m**								
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay occ. wood fragments moist	0.5		1	SS	8		0.5	above grade monument casing set in concrete bentonite seal/50 mm I.D. PVC riser
360.92 0.90		1.0		2	SS	17		1.0	water level in monitoring well measured at 1.00 m depth (360.82 mASL) on July 9, 2026
	firm to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to APL	1.5		3	SS	18		1.5	3.05 m long, 50 mm I.D. PVC screen with sandpack
		2.0						2.0	
		2.5		4	SS	17		2.5	
	-------- grey	3.0						3.0	
		3.5		5	SS	15		3.5	
		4.0		6	SS	9		4.0	
		4.5						4.5	
		5.0		7	SS	4		5.0	LL: 29, PL: 16
		5.5						5.5	
		6.0						6.0	
355.12 6.70		6.5		8	SS	7		6.5	
	End of Borehole	7.0						7.0	
		7.5						7.5	
		8.0						8.0	
		8.5						8.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 5

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Hollow Stem Augers**
Size: **108 mm I.D.**
Date: **Jul 02 - 26** TO **Jul 02 - 26**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **360.44 m**								
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay occ. wood fragments moist	0.5		1	SS	6		0.5	above grade monument casing set in concrete; bentonite seal/50 mm I.D. PVC riser
359.54 0.90	stiff to very stiff, brown SILTY CLAY trace gravel, trace sand occ. sand seams DTPL to APL	1.0		2	SS	13		1.0	
		1.5		3	SS	17		1.5	water level in monitoring well measured at 1.71 m depth (358.73 mASL) on July 9, 2026
		2.0						2.0	
	-------- grey	2.5		4	SS	16		2.5	3.05 m long, 50 mm I.D. PVC screen with sandpack
		3.0		5	SS	16		3.0	
		3.5						3.5	
		4.0		6	SS	15		4.0	
		4.5						4.5	
		5.0		7	SS	18		5.0	
		5.5						5.5	
		6.0						6.0	
		6.5		8	SS	18		6.5	
		7.0						7.0	
		7.5						7.5	
		8.0		9	SS	22		8.0	
352.19 8.25	End of Borehole	8.5						8.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

DRAFT

PROJECT MANAGER: **MM/YC**

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FILE No: 3211G

BOREHOLE No. 6

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Hollow Stem Augers**
Size: **108 mm I.D.**
Date: **Jul 02 - 26** TO **Jul 02 - 26**

Ground Elevation: **362.70 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	SHEAR STRENGTH (kPa) / PENETRATION RESISTANCE	WATER CONTENT (%)	WELL DATA	DEPTH (m)	REMARKS
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil trace clay moist	0.5		1	SS	6				0.5	
361.80											
0.90	firm to very stiff, brown SILTY CLAY trace sand occ. sand seams DTPL to APL	1.0		2	SS	21				1.0	
		1.5								1.5	
		2.0		3	SS	20				2.0	
		2.5		4	SS	15				2.5	
	-------- grey	3.0								3.0	
		3.5		5	SS	23				3.5	
		4.0		6	SS	23				4.0	
		4.5								4.5	
		5.0		7	SS	14				5.0	
		5.5								5.5	
		6.0								6.0	
		6.5		8	SS	6				6.5	
356.00											
6.70	End of Borehole	7.0								7.0	borehole open and dry upon removal of augers
		7.5								7.5	
		8.0								8.0	
		8.5								8.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 7

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Solid Stem Augers**
Size: **152 mm O.D.**
Date: **Jul 03 - 26** TO **Jul 03 - 26**

Ground Elevation: **362.34 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SAMPLE ID	TYPE	N-VALUE
	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay moist	0.5	1	SS	6
361.59 / 0.75	stiff to very stiff, brown SILTY CLAY trace gravel, trace sand occ. silt seams DTPL	1.0	2	SS	9
		1.5	3	SS	20
		2.0			
		2.5	4	SS	25
	-------- grey	3.0			
359.29 / 3.05	very dense, grey SILT TILL trace sand, trace clay moist	3.5	5	SS	51
		4.0	6	SS	57
		4.5			
357.59 / 4.75	stiff to very stiff, grey SILTY CLAY trace gravel, trace sand occ. sand seams DTPL to APL	5.0	7	SS	15
		5.5			
		6.0			
		6.5	8	SS	8
355.64 / 6.70	End of Borehole	7.0			
		7.5			
		8.0			
		8.5			

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS

- above grade monument casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- water level in monitoring well measured at 0.99 m depth (361.36 mASL) on July 9, 2026
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 8

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Solid Stem Augers**
Size: **152 mm O.D.**
Date: **Jul 03 - 26** TO **Jul 03 - 26**

Ground Elevation: **363.16 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	SHEAR STRENGTH (kPa) / PENETRATION RESISTANCE	WATER CONTENT (%)	WELL DATA	DEPTH (m)	REMARKS
362.36	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay moist	0.5		1	SS	7				0.5	
0.80	firm to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to APL	1.0		2	SS	5				1.0	
		1.5								1.5	
		2.0		3	SS	12				2.0	
	-------- freq. silt seams	2.5		4	SS	25				2.5	
	-------- grey	3.0								3.0	
		3.5		5	SS	20				3.5	
		4.0		6	SS	15				4.0	
		4.5								4.5	
		5.0		7	SS	22				5.0	
		5.5								5.5	
		6.0								6.0	
		6.5		8	SS	17				6.5	
356.46											
6.70	End of Borehole	7.0								7.0	borehole open and dry upon removal of augers
		7.5								7.5	
		8.0								8.0	
		8.5								8.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 9

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
Method: **Solid Stem Augers**
Size: **152 mm O.D.**
Date: **Jul 03 - 26** TO **Jul 03 - 26**

Ground Elevation: **364.94 m**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SAMPLE ID	TYPE	N-VALUE
364.34	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay moist	0.5	1	SS	6
0.60	stiff to very stiff, brown SILTY CLAY trace gravel, trace sand occ. silt seams DTPL	1.0	2	SS	14
		1.5	3	SS	19
362.64		2.0			
2.30	compact to dense, grey SILT TILL trace sand, trace clay occ. clayey silt seams moist to wet	2.5	4	SS	46
		3.0	5	SS	28
		3.5			
		4.0	6	SS	32
360.54		4.5			
4.40	very stiff, grey SILTY CLAY trace gravel, trace sand occ. silt lenses DTPL	5.0	7	SS	21
		5.5			
		6.0			
358.24		6.5	8	SS	21
6.70	End of Borehole	7.0			
		7.5			
		8.0			
		8.5			

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS

- above grade monument casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- water level in monitoring well measured at 0.98 m depth (361.36 mASL) on July 9, 2026
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

DRAFT

PROJECT MANAGER: **MM/YC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G

BOREHOLE No. 10

Client: **James Gies Construction Ltd. c/o Meritech Engineering**

Project: **Proposed Subdivision**

Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

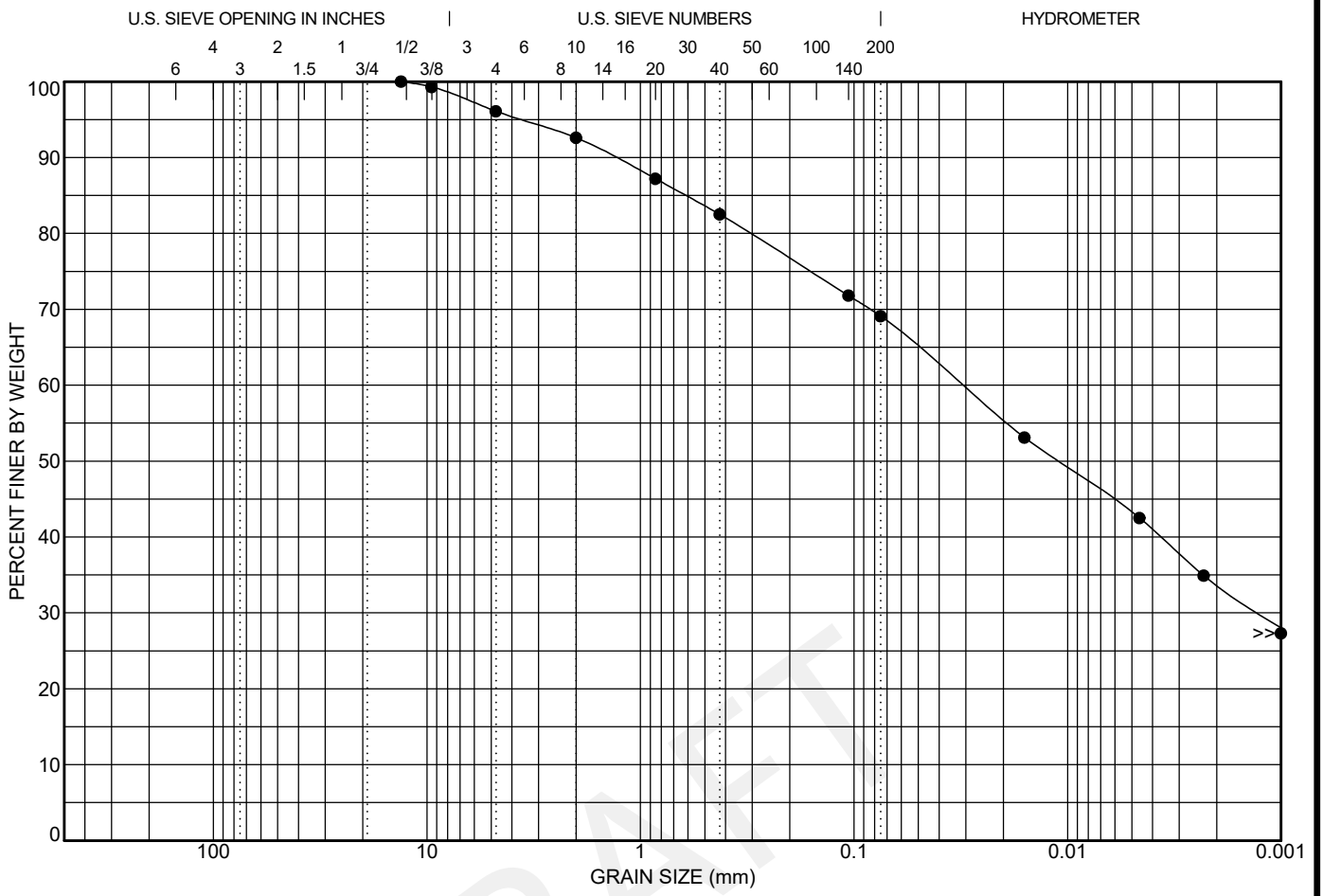
Machine: **Diedrich D-70T**
Method: **Solid Stem Augers**
Size: **152 mm O.D.**
Date: **Jul 03 - 26** TO **Jul 03 - 26**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	SHEAR STRENGTH (kPa) / PENETRATION RESISTANCE	WATER CONTENT (%)	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **363.78 m**						FIELD VANE: Peak ⊗ Rem. ×; LAB TEST: Unc. ■ P.P. □; 50 100 150 200; STANDARD ● DYN. CONE ○; 20 40 60 80	W_P W W_L; 10 20 30			
363.18	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay moist	0.5		1	SS	6				0.5	
0.60	stiff to very stiff, brown SILTY CLAY trace gravel trace sand (to sandy above 1.35 m) occ. silt seams DTPL -------- grey	1.0		2	SS	13				1.0	
		1.5		3	SS	18				1.5	
		2.0								2.0	
		2.5		4	SS	17				2.5	
		3.0		5	SS	12				3.0	
		3.5								3.5	
		4.0		6	SS	31				4.0	
		4.5								4.5	
		5.0		7	SS	19				5.0	
		5.5								5.5	borehole cave- in to 5.5± mbgs upon removal of augers
		6.0								6.0	
357.08		6.5		8	SS	8				6.5	
6.70	End of Borehole	7.0								7.0	
		7.5								7.5	
		8.0								8.0	
		8.5								8.5	

DRAFT

PROJECT MANAGER: **MM/YC**

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
					13.2	0.031	0.001		3.9	27.0	69.1	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 2 - SA 3; 1.50 to 2.10 m depth
Sample No.: 2-3
Date Sampled: Jul. 02 - 2026
Sampled By: RP
Lab No.: 812
Date Tested: Jul. 27 - 2026
Type of Material: Sandy Silty Clay, trace gravel

Sieve Size (mm)	Percent Passing	No Specifications

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision

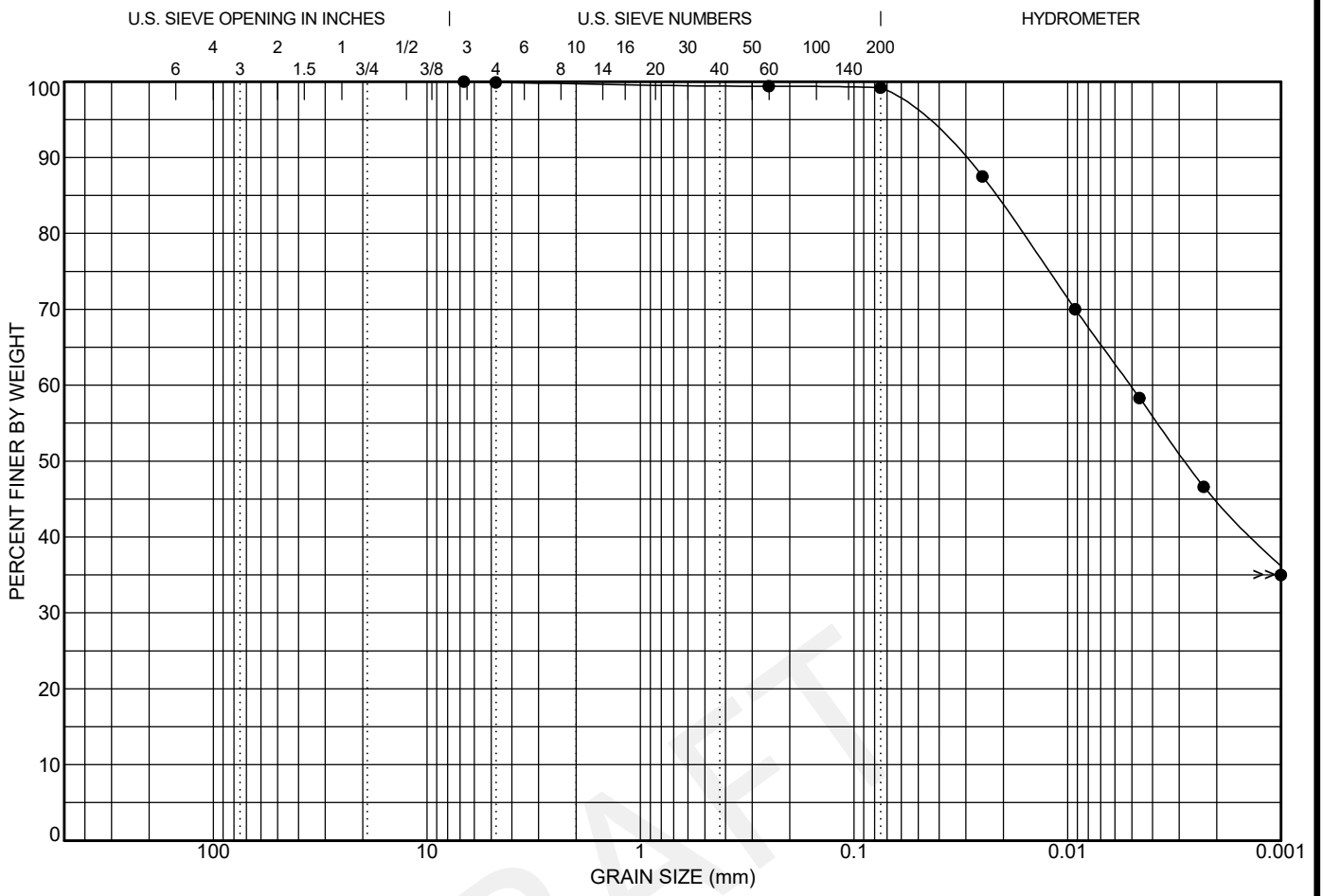
Location: 1949 Gerber Road, Wellesley, Ontario

File No.: 3211G

Enclosure No.: 11

DRAFT

DM - NO SPECIFICATIONS 3211G - 1949 GERBER ROAD, WELLESLEY.GPJ LAW LNDN.GDT 26-8-12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
29	16				6.7	0.005			0.1	0.7	99.2	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 4 - SA 7; 4.55 to 5.15 m depth
Sample No.: 4-7
Date Sampled: Jul. 02 - 2026
Sampled By: RP
Lab No.: 815
Date Tested: Jul. 27 - 2026
Type of Material: Silty Clay, trace sand

Sieve Size (mm)	Percent Passing	No Specifications

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision

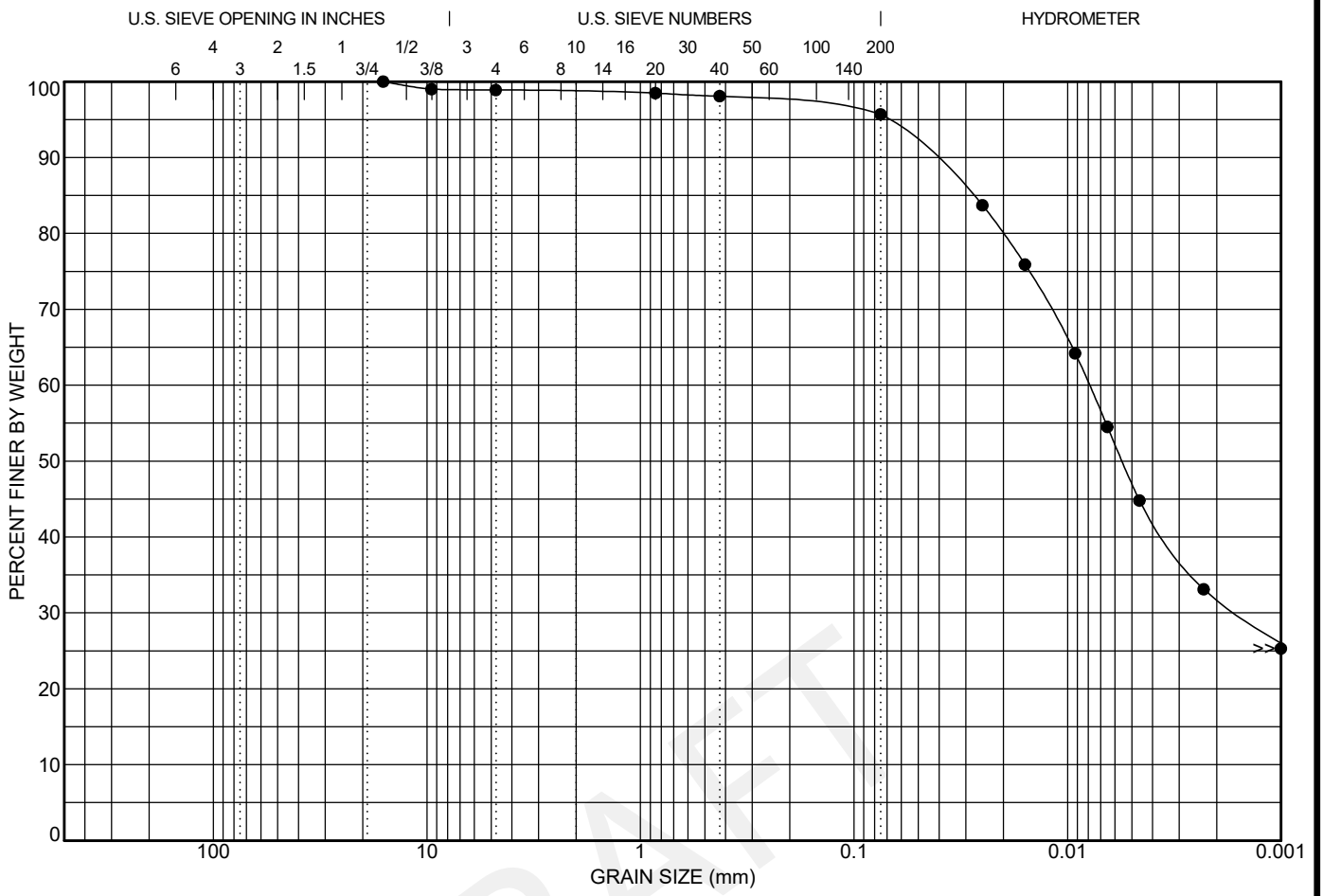
Location: 1949 Gerber Road, Wellesley, Ontario

File No.: 3211G

Enclosure No.: 12

DRAFT

DM - NO SPECIFICATIONS 3211G - 1949 GERBER ROAD, WELLESLEY.GPJ LAW LNDN.GDT 26-8-12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
					16	0.008	0.002		1.1	3.2	95.7	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 5 - SA 4; 2.30 to 2.90 m depth
Sample No.: 5-4
Date Sampled: Jul. 02 - 2026
Sampled By: RP
Lab No.: 813
Date Tested: Jul. 27 - 2026
Type of Material: Silty Clay, trace gravel, trace sand

Sieve Size (mm)	Percent Passing	No Specifications

DRAFT

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311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

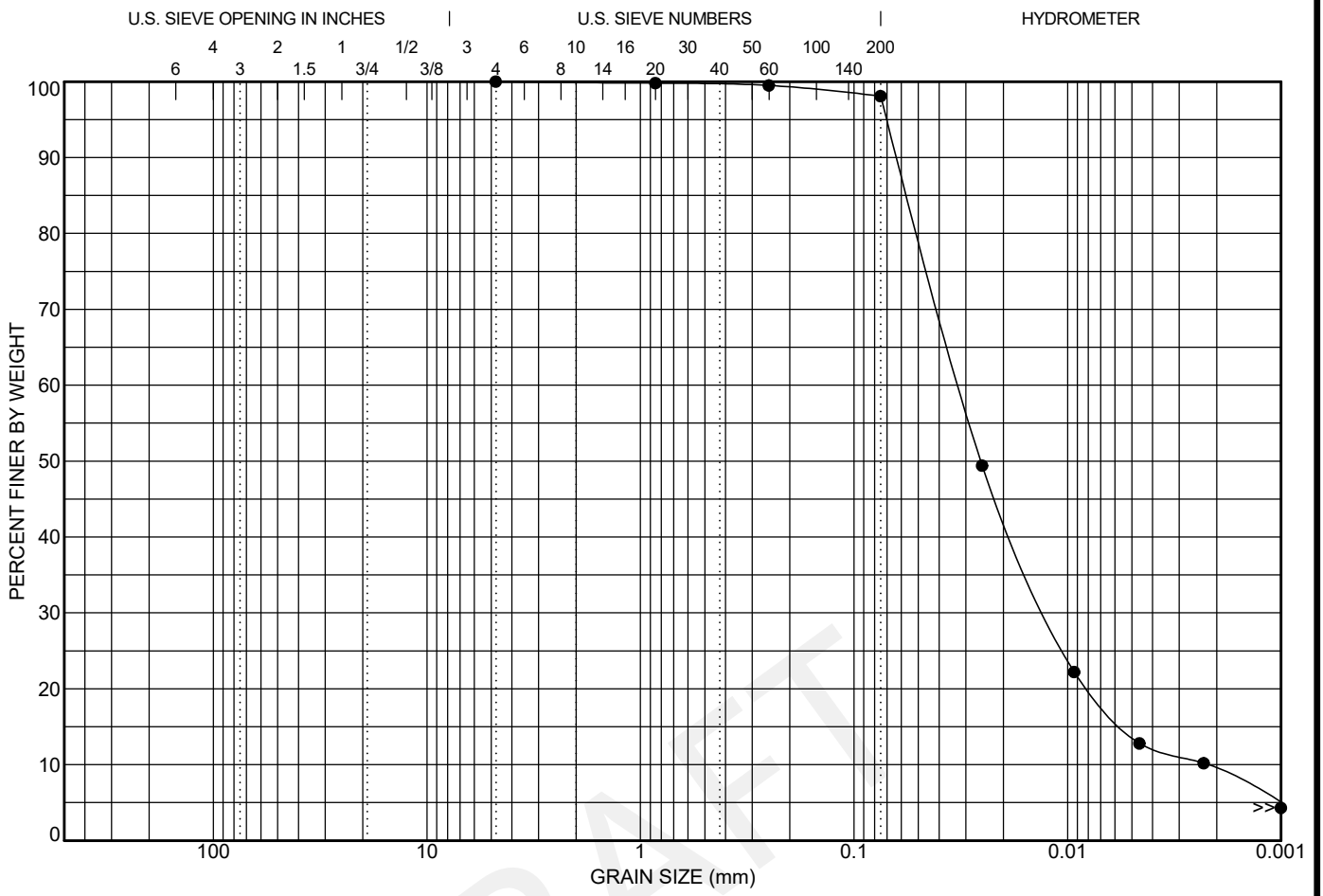
Project: Proposed Subdivision

Location: 1949 Gerber Road, Wellesley, Ontario

File No.: 3211G

Enclosure No.: 13

DM - NO SPECIFICATIONS 3211G - 1949 GERBER ROAD, WELLESLEY.GPJ LAW LNDN.GDT 26-8-12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			2.15	14.30	4.75	0.032	0.012	0.002	0.0	1.9	98.1	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 9 - SA 4; 2.30 to 2.90 m depth
Sample No.: 9-4
Date Sampled: Jul. 03 - 2026
Sampled By: RP
Lab No.: 814
Date Tested: Jul. 27 - 2026
Type of Material: Silt Till, trace sand, trace clay

Sieve Size (mm)	Percent Passing	No Specifications

DRAFT

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ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision

Location: 1949 Gerber Road, Wellesley, Ontario

File No.: 3211G

Enclosure No.: 14

DM - NO SPECIFICATIONS 3211G - 1949 GERBER ROAD, WELLESLEY.GPJ LAW LNDN.GDT 26-8-12

Table 1 - Summary of Water Levels, Elevations & Fluctuations

1949 Gerber Road, Township of Wellesley
CVD Engineering Ltd.
Project: 3211H

Monitoring Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Stickup (m)	Water Level (mbgs)	Water Elevation (mASL)
				09-Jul-26	09-Jul-26
BH 2	355.88	356.66	0.78	2.80	**353.08**
BH 4	361.82	362.60	0.77	1.00	**360.82**
BH 5	360.44	361.28	0.84	1.71	**358.73**
BH 7	362.34	363.15	0.81	0.99	**361.36**
BH 9	364.94	365.75	0.81	0.98	**363.96**

Notes:

1) All Elevations Referenced to Geodetic Survey by CVD.
2) **Bolded** elevations represent the maximum water table aquifer elevation manually measured at each monit throughout all seasons.
3) Negative water level indicates that water level is above ground.
4) : Monitoring well dry.
5) Negative fluctuation indicates drop in water level relative to baseline.
6) : Water level not stabilized.



LEGEND

- Approximate Site Boundary
- Monitoring Well Location
- (361.36) Water Table Elevation (mASL)
- 361.00 Interpreted Groundwater Contour (mASL)
- Interpreted Shallow Groundwater Flow Direction

N

0 50 100 m

Scale 1:2,500

Image Ref.: Region of Waterloo; ESRI; Property Search Map; Retrieved: August 2026

Figure 1:
Water Table Interpretation (July 9, 2026)

Supplementary Hydrogeological Assessment
Proposed Residential Development

1949 Gerber Road
Township of Wellesley, ON

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

Drawn By: YC	Date: August 2026	File No.: 3211H

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**WT2621353**			
Client	:	**Chung & Vander Doelen Engineering Ltd.**	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Mark Marriner	Account Manager	:	Andrew Martin
Address	:	311 Victoria St. N. Kitchener Ontario Canada N2H 5E1	Address	:	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	:	+1 519 886 6910
Project	:	1949 GERBER ROAD, WATERLOO (WELLESLEY)	Date Samples Received	:	22-Jul-2026 17:35
PO	:	3211	Date Analysis Commenced	:	29-Jul-2026
C-O-C number	:	----	Issue Date	:	30-Jul-2026 12:27
Sampler	:	RP			
Site	:	----			
Quote number	:	2026 Excess Soils Quote			
No. of samples received	:	3			
No. of samples analysed	:	3			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario

No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
mg/L	milligrams per litre
mS/cm	millisiemens per centimetre

>: greater than.
<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Analytical Results Evaluation

Matrix: Soil/Solid			Client sample ID	BH 2 SS 1 ----	BH 4 SS 1 ----	BH 9 SS 1 ----	----	----	----	----
			Client sampling date / time	02-Jul-2026 12:00	02-Jul-2026 12:00	03-Jul-2026 12:00	----	----	----	----
			Sub-Matrix	Soil	Soil	Soil	----	----	----	----
Analyte	*CAS Number*	*Method/Lab*	*Unit*	**WT2621353-001**	**WT2621353-002**	**WT2621353-003**	**----**	**----**	**----**	**----**
				Result	Result	Result	----	----	----	----
Physical Tests										
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm	0.222	0.143	0.153	----	----	----	----
Metals										
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L	17.8	8.10	8.59	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L	2.39	1.03	1.81	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L	2.88	0.85	0.92	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	-	0.17	<0.10	<0.10	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T1-RPIICC	ON406 T2.1-S-AG	ON406 T2.1-S-ICC	ON406 T2.1-S-RPI			
Physical Tests									
Conductivity (1:2 leachate)		mS/cm	**0.57 mS/cm**	**0.7 mS/cm**	**1.4 mS/cm**	**0.7 mS/cm**	----	----	----
Metals									
Calcium, soluble ion content	7440-70-2	mg/L	----	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	mg/L	----	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	mg/L	----	----	----	----	----	----	----
Sodium adsorption ratio [SAR]		-	**2.4 -**	**5 -**	**12 -**	**5 -**	----	----	----

Key:

ON153/04		Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
	T1-RPIICC	153 Soil T1 Res/Park/Inst/Ind/Com/Commu Property Use
ON406		Ontario Regulation 406/19 - Excess Soils (Bulk) (12-April -2022)
	T2.1-S-AG	406 T2.1 - Volume Independent Soil - Agricultural or Other Property Use
	T2.1-S-ICC	406 T2.1 - Volume Independent Soil - Ind/Com/Commu Property Use
	T2.1-S-RPI	406 T2.1 - Volume Independent Soil - Res/Park/Inst Property Use

Quality Control Interpretive Report

Work Order	:	**WT2621353**			
Client	:	Chung & Vander Doelen Engineering Ltd.	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Mark Marriner	Account Manager	:	Andrew Martin
Address	:	311 Victoria St. N. Kitchener ON Canada N2H 5E1	Address	:	60 Northland Road, Unit 1 Waterloo Ontario Canada N2V 2B8
Telephone	:	----	Telephone	:	+1 519 886 6910
Project	:	1949 GERBER ROAD, WATERLOO (WELLESLEY)	Date Samples Received	:	22-Jul-2026 17:35
PO	:	3211	Issue Date	:	30-Jul-2026 12:27
C-O-C number	:	----			
Sampler	:	RP			
Site	:	----			
Quote number	:	2026 Excess Soils Quote			
No. of samples received	:	3			
No. of samples analysed	:	3			

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Laboratory Control Sample Duplicate (LCSD) outliers occur
- No Matrix Spike outliers occur.
- No Matrix Spike Duplicate (MSD) outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and/or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Soil/Solid

Evaluation: × = Holding time exceedance; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client sample ID	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
						Rec	Actual			Rec	Actual	
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 2 SS 1	001	2733626	E484	02-Jul-2026	29-Jul-2026	180 days	27 days	✓	29-Jul-2026	180 days	0 days	✓
BH 4 SS 1	002	2733626	E484	02-Jul-2026	29-Jul-2026	180 days	27 days	✓	29-Jul-2026	180 days	0 days	✓
BH 9 SS 1	003	2733626	E484	03-Jul-2026	29-Jul-2026	180 days	26 days	✓	29-Jul-2026	180 days	0 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 2 SS 1	001	2733627	E100-L	02-Jul-2026	29-Jul-2026	30 days	27 days	✓	29-Jul-2026	30 days	27 days	✓
BH 4 SS 1	002	2733627	E100-L	02-Jul-2026	29-Jul-2026	30 days	27 days	✓	29-Jul-2026	30 days	27 days	✓
BH 9 SS 1	003	2733627	E100-L	03-Jul-2026	29-Jul-2026	30 days	26 days	✓	29-Jul-2026	30 days	26 days	✓

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: Soil/Solid

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method / Lab	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	1	3	33.3	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	2	3	66.7	10.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	2	3	66.7	10.0	✓
Method Blanks (MB)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	1	3	33.3	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	1	3	33.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.
Preparation Methods	**Method / Lab**	**Matrix**	**Method Reference**	**Method Descriptions**
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.

QUALITY CONTROL REPORT

Work Order	:	**WT2621353**			
Client	:	Chung & Vander Doelen Engineering Ltd.	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Mark Marriner	Account Manager	:	Andrew Martin
Address	:	311 Victoria St. N. Kitchener ON Canada N2H 5E1	Address	:	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	:	+1 519 886 6910
Project	:	1949 GERBER ROAD, WATERLOO (WELLESLEY)	Date Samples Received	:	22-Jul-2026 17:35
PO	:	3211	Date Analysis Commenced	:	29-Jul-2026
C-O-C number	:	----	Issue Date	:	30-Jul-2026 12:27
Sampler	:	RP			
Site	:	----			
Quote number	:	2026 Excess Soils Quote			
No. of samples received	:	3			
No. of samples analysed	:	3			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key:

Anonymous=Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number=Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO=Data Quality Objective.
LOR=Limit of Reporting (detection limit).
RPD=Relative Percent Difference
# =Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests(QC Lot: 2733627)											
WT2621353-003	BH 9 SS 1	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.153 mS/cm	151	1.12 %	20%	---
Metals(QC Lot: 2733626)											
WT2621353-003	BH 9 SS 1	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	8.59	8.36	2.71 %	30%	---
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.81	1.79	0.02	Diff <2x LOR	---
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	0.92	0.89	0.04	Diff <2x LOR	---

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests(QC Lot: 2733627)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Metals(QC Lot: 2733626)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests(QC Lot: 2733627)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	101	90.0	110	----
Metals(QC Lot: 2733626)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	105	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	101	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	103	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: Soil

					Reference Material (RM) Report				
					RM	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Target Concentration	RM	Low	High	Qualifier
Physical Tests(QC Lot: 2733627)									
QC-MRG2-2733626001		Conductivity (1:2 leachate)	----	E100-L	930 µS/cm	# 97.1	70.0	130	----
Metals(QC Lot: 2733626)									
QC-MRG2-2733626001		Calcium, soluble ion content	7440-70-2	E484	109.9 mg/L	# 105	70.0	130	----
		Magnesium, soluble ion content	7439-95-4	E484	11.82 mg/L	# 102	70.0	130	----
		Sodium, soluble ion content	17341-25-2	E484	43.02 mg/L	# 90.9	70.0	130	----

S/C Sol-938

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Environmental Division Waterloo

Work Order Reference

WT2621353

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	CVD
Contact:	Mark Marriner
Phone:	519 742 8979
	Company address below will appear on the final report
Street:	311 Victoria St N
City/Province:	Kitchener, ON
Postal Code:	N2H 5E1
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	CVD
Contact:	

Project Information

ALS Account # / Quote #:	
Job #:	1949 Gerber Road, Waterloo (Wellesley)
PO / AFE:	3211
LSD:	

ALS Lab Work Order # (ALS use only):

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: mark.marriner@cvdengineering.com

Email 2:

Email 3:

Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax:

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: AM **Sampler:** RP

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, s

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	EC and SAR	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH 2 SS 1	July 02-2026	12:00	SOIL	1	R			
	BH 4 SS 1	July 02-2026	12:00	SOIL	1	R			
	BH 9 SS 1	July 03-2026	12:00	SOIL	1	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

O.Reg. 153/04 Table 1 RPI/ICC O.Reg. 406/19 Table 2.1 Ag

O.Reg. 406/19 Table 2.1 RPI/ICC

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
	13 8

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Katarina Poganatz	July 22-2026	17:30

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
PO	22-JUL-26	17:35

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Meritech Engineering 1315 Bishop Street North Suite 202 Cambridge ON N1R 6Z2 t 519.623.1140 f 519.623.7334